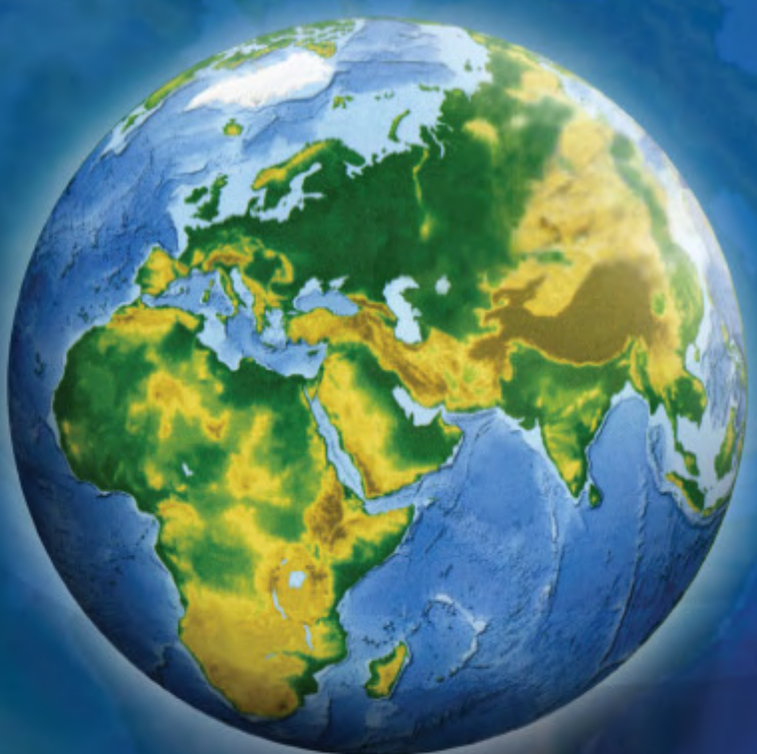
Kingdom of Bahrain
Ministry of Health
Directorate of Training

Healthcare Management



Continuous Quality Improvement (CQI) Projects

Volume 1

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Healthcare Management Program in Collaboration with the Royal College of Surgeons, Ireland

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Introduction

Introduction

Over the past twenty years, Health care in Bahrain has developed significantly. Many new facilities have been built and equipped to meet the needs for health care among the citizens of Bahrain. Many young Bahraini men and women have been sponsored to attend advanced education and training programs at overseas and area institutions, resulting in a large number of certified health care professionals in various specialties and at all levels of the Ministry of Health (MOH).

In 1995 the Ministry of Health, Kingdom of Bahrain realized the great need to develop a large number of health care professionals to become better managers and leaders. Hence the joint Royal College of Surgeons, Ireland (RCSI) and the MOH, Kingdom of Bahrain agreed to cooperate to develop a Diploma Program in Health Care Management to be jointly designed, developed, implemented, and evaluated by the two organizations.

Who is this program for?

The categories of professionals who require this training include physicians (chairpersons, consultants), supervisors in nursing and allied health professions at several levels of the organization, administrators in various other support units of the MOH, and employees occupying supervisory positions outside the MOH.

This is the seventh year that this program is in effect, and it has qualified around 200 candidates from the different sections of MOH, CSB and BDF Hospital. Of those who graduated, 51% are physicians, 22% are nurses and other allied health care professionals, 10% are administrators and 17% are tutors and health instructors. Yearly evaluation of the content of the Diploma program takes place, and changes are made to the course accordingly.

Purpose of this booklet

This document presents a summary of more than 70 CQI projects developed by Healthcare Management (HCM) course candidates. These projects provide evidence-based data on the situation of the healthcare challenges facing the health organization and provide some solutions to meet those challenges. This piece of work provides the policy makers with baseline data that could be used to update some existing policies or develop new ones, and also could be utilized by health care professionals to improve the services provided within their departments.

I am grateful to all the graduates of the Healthcare Management Program, whose summary projects are published in this document, for their prompt response and interest in sharing their projects with the rest of the Ministry staff. Without their support this document could not have been published.

Overview of the Content of the Diploma Program

This HCM diploma program consists of a core foundation block, consisting of 40-50 hours of classroom instruction, and three follow-up blocks of 30 hours of classroom instruction. A block is supplemented with application assignments, which would require 15-20 hours of work for the leadership assignment and 100 hours for the Continuous Quality Improvement project.

The blocks include the following

Block 1: Foundation of Management Module

The entry-level prerequisite for all students, and a stand-alone course that consists of a review of the management principles. This course serves as an introduction to the other three blocks and provides a foundation level of knowledge for all participants. Students learn about history and theories of management, the managerial environment, ethics, responsibilities of managers, planning, organizing, leading and controling functions of the manager. Each student must pass a 2-hour open book exam (60%) and meet other learner expectations in order to receive a certificate.

Block 2: Leadership Module

This section covers the motivation theories, the nature of leadership in organizations, leadership traits, situational approaches to leadership, managing group and group process, team building and communication, and continuous quality improvement. Each student must complete a project (academic paper on leadership and a personal mission statement).

Block 3: Planning and Controlling Module

This course covers organizational goals, tactical and operational planning, decision making techniques, links between planning and controlling, types of control, steps in the control process, budgetary control, human resource control and performance management. Each student must complete a project (team based, change management/continuous quality improvement project).

Block 4: Organizing Module

This module covers patterns of authority, span of management, working groups, staff development, managing organizational conflict, organizational design and culture, and organizational change.

The blocks are sequential in nature; an employee is not eligible to enter a subsequent block unless the preceding block has been successfully completed. The entire sequence of four blocks must be completed within three years of admission to the program, or the employee must request readmission to the program and must sit all four blocks again.

Amina Abdulla Janahi
Director of Training
Ministry of Health

The Development of Healthcare Management Training in Bahrain

The changing nature of healthcare in the 1990s highlighted the growing need for health professionals to become involved in management. Increasing patient expectations, concerns about escalating costs and the emergence of a team approach to the delivery of healthcare were just some of the factors that influenced this trend. Most health professionals found that their training had not provided them with the management knowledge and skills needed to cope with their increasingly complex roles.

In 1993, the Directorate of Training in the Ministry of Health, Kingdom of Bahrain conducted a training needs analysis; and this indicated the importance of management development and training for middle and senior level leaders. Bahrain had developed a sophisticated modern system in which healthcare was delivered through hospitals but particularly through Health Centres based in the community. This distributed system required healthcare professionals to become familiar with modern management practices.

The Royal College of Surgeons in Ireland (RCSI) had been involved in Bahrain for some years before this, in collaborative training and assessment programs in surgery and psychiatry and had pioneered management training for health professionals in Ireland. H.E. Mr. Jawad Salim Al-Arrayed, the then Minister of Health, proposed that the Ministry of Health should align its efforts in management development with the RCSI.

The Royal College of Surgeons in Ireland

The Royal College of Surgeons in Ireland (RCSI) was founded in 1784 by Royal Charter and given the responsibility for controlling the practice of surgery and the education and training of surgeons. The modern College still fulfils these roles; but, in addition, it is home to faculties of Radiology, Anaesthetics, Dentistry and Surgery and is heavily involved in management development training in the healthcare field. The College's undergraduate Medical School is the largest in Ireland and admits up to 240 students annually from up to 50 different countries. In addition to medicine, the College also provides undergraduate training in physiotherapy, nursing, and pharmacy. The RCSI has a very strong international orientation. Its mission has always been to assist countries or communities to improve their healthcare systems through education and training. The College provides courses and examinations in different parts of the world but is particularly involved in the Middle East in countries such as Bahrain, Saudi Arabia, Kuwait and Jordan. The RCSI is also one of the founding partners of the Penang Medical College in Malaysia.

Collaboration Between the Ministry of Health and the RCSI.

Several reasons were identified by the leaders in the Ministry of Health for collaborating with the RCSI. Successful collaboration had already been established in training physicians and surgeons in sub-specialties and the RCSI had an established reputation in the Middle East. The RCSI developed expertise in providing management training for healthcare professionals in the Irish health system and was providing management expertise in a number of countries including Saudi Arabia. It was felt that the RCSI could contribute a complimentary perspective to that already existing in Bahrain. It was also felt that a Diploma awarded jointly by the Ministry of Health and the RCSI would prove attractive to busy healthcare professionals in Bahrain.

The proposed collaboration would prove to be mutually beneficial because specialists from Ireland would learn from the expertise of their colleagues in Bahrain, and the experience gained in developing and running the collaborative program would contribute to programs in Ireland.

A Framework for Cooperation between the Ministry of Health in Bahrain and the RCSI was developed in 1994 to guide the development and implementation of the program. A co-ordinating committee was established with representatives from both organisations, and a program leading to a Diploma in Healthcare Management was designed. The designers paid careful attention to the established research literature on success factors for such programs. The course was designed in a four block structure to allow a period of time between training modules which would reduce the pressure on busy managers who were, in most cases, practicing physicians, nurses and allied health specialists. This structure also allowed participants to apply knowledge and to practice the skills learned in the course. The first program was conducted in 1995, and the basic structure proved to be successful and has been retained with only minor modifications. Since 1995, 200 candidates have successfully completed the program and have been awarded the Diploma in Healthcare Management.

Prof. Cairan O. Boyle
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Overview of the CQI Project

In modern organizations, managers and leaders feel many pressures. Budgets are limited, the public demands an increased number and quality of services, staff feel overworked, complaints are on the rise, and leaders demand accountability for performance. As the Diploma in Healthcare Management was being developed in the mid-1990s, we recognized the importance of providing participants with a set of tools that would help them meet the pressures felt in today's managerial and organizational environments. Additionally, we intended to show officials in the Ministry of Health, the Bahrain Defence Forces Hospital, the Civil Service Bureau, and other sending organizations that their investment in the course would return a good result. Therefore, it was decided that training in the use of Continuous Quality Improvement should constitute a significant portion of the course.

Continuous Quality Improvement (CQI) is defined by some as "managing the continuous improvement of service delivery processes and outcomes through data-driven strategies and empowered staff to exceed customer expectations" (Smith, Discenza, and Piland, 1995). CQI is a process that is very similar to one of the many problem-solving processes (including the process used by physicians and nurse practitioners when treating patients).

Continuous quality improvement models require that we:

- Do right things right the first time.
- Set high standards.
- Accept responsibility and accountability.
- Be innovative, flexible, and quick.
- Be customer-focused.
- Collect and use data for decision-making.
- Strive to improve everything we do (processes).
- Involve everyone in the process (teamwork that includes the customer).

When beginning CQI activities, the heart of analysis is customer (or patient) needs. Quality is not the absence of errors as defined by the supplier, but presence of value as defined by the customer. Customer satisfaction occurs when customer needs and expectations are met or exceeded. CQI models are team-based, and they typically include three phases:

1. Identify Customer/Supplier Partnerships.
During Phase 1, it is necessary to clearly identify the products/services you provide to your customers and what attributes of quality (speed, taste, friendliness, value for money, durability, etc.) they consider important. Identify the products/services you receive from your suppliers, and tell them what you consider important, too. This process clearly informs all players of important expectations, a requisite for high performance.

2. Improvement Model.
When you can't deliver services or products in a timely manner, when your competitors have developed a better product or service, when your workers are not following established processes, or when the processes are not delivering the results demanded by customers, you should begin the six-step problem-solving process:

- Identify the problems or opportunities for improvement.
- Analyze for root cause.
- Generate alternative solutions.

- Select an alternative(s); plan implementation.
- Implement.
- Evaluate, standardize, reinforce.

3. Continually Try for Better Results

If the results hit your team's target, set higher standards and run the CQI process again. The key is to try for continual improvement. If the results fail to hit your team's target, run the process again.

Managers and leaders who engage in CQI also learn to follow the advice of Kouzes and Posner (1999) who write that we must

- Challenge organizational processes when they don't deliver the appropriate results for our customers.
- Inspire a shared vision of what the future should look like (customers will be 100% satisfied, services will be provided in a timely manner, staff will feel better about working in your department, you will operate within budget, etc.).
- Enable others to act (train staff in CQI then delegate responsibility and authority for improvement to them).
- Model the way: We model by actions (80%) and words (20%).
- Encourage the heart (reward for CQI behaviors and results, motivate, support when difficulties arise).

For nearly eight years, participants have been conducting CQI projects as part of the requirements for the Diploma in Healthcare Management. The following table lists a number of completed projects and their projected BD savings to the Government of the Kingdom of Bahrain.

Table 1: Selected CQI Projects and Cost Savings

1. Overutilization of Lab Services at SMC (Hb Electrophoresis and G6PD tests). This project recommends ways of reducing unnecessary tests and a projected cost savings to the MOH of BD 21,600 annually.

2. Reducing Repeat Intraoral X-Rays (Dental). This project sought to reduce the number of repeat x-rays required through enhanced training and feedback. A cost savings of BD 10,500 is projected annually.

3. Voluntary Blood Donation at BDF Hospital. The goal of this project was to improve the quality of the blood supply and reduce the cost of obtaining blood through an innovative approach. Already implemented, this project has increased monthly supply of blood over October and November 1997 levels while saving BDF hospital BD 3,770 during these two months. If annualized, the savings could be projected at more than BD 20,000.

4. Reduction in Promotion Process Cost at CSB. This project reduced the standard number of days for processing promotions for all government employees from 39 to 27 days, resulting in an annual cost savings of nearly BD 500,000 in manpower costs.

5. Overutilization of Lab Services by SMC Accident and Emergency Department. Twenty-two percent of all lab tests requested by A&E are judged to be unnecessary. A team project is being introduced and preliminary results suggest an 18% reduction in unnecessary tests (a savings of nearly BD 30,000). If the project

goals are met, the annual savings could reach more than BD 150,000.

6. **Reduction of Reject X-Rays in SMC.** This project aims to improve the quality of all x-rays through training and feedback. Potential cost savings of approximately BD 20,000 annually.

7. **Shortening the Process for Recruiting Nursing Graduates.** Through a redesigned procedure that reduces the number of days for recruitment from 107 to 61, a cost savings of BD 12,750 per year will be achieved.

8. **Expanding Day-Case Treatment in Psychiatric Hospital.** By increasing the number of geriatric day-case patients by 50%, this project can achieve a savings of BD 68,400 yearly.

9. **More Rapid Discharge of Selected Appendectomy Cases.** This project will achieve an annual savings of BD 80,000 in reduced hospital stay if straightforward appendectomies are managed more appropriately.

10. **Reduction of Unnecessary X-Rays in Al-Razi Health Centre.** The project intends to more carefully target x-rays for pre-employment examinations of expatriate workers with a potential savings of BD 23,750 annually. The project will also increase customer satisfaction and reduce wait time significantly.

11. **Reduction of Overtime in Directorate of Medical Equipment Directorate.** Estimated cost savings of BD 12,000 annually due to re-engineered methods of assigning work.

12. **Increase in Customer Satisfaction in Pediatric Day Care Unit.** Overall increase in customer (pediatric patients and their parents) satisfaction from 22% to 98% following team-based solutions.

13. **Increase in Satisfaction Rates in Diagnostic GTT Lab Test.** This CQI team designed a unique solution to increase customer satisfaction with quality of oral glucose solution from 30% to 85%.

14. **Reducing Unnecessary Prescriptions at Isa Town Health Center.** Annualized reduction of BD 48,000 due to quality improvement solutions.

15. **Increase in Customer Satisfaction in Directorate of Engineering and Maintenance.** A CQI team increased levels from 75% to 88% as a result of creative solutions.

16. **Reduction in "In-Hospital" Stay for Normal Pregnancy.** A team at BDF implemented a clinical pathways approach to CQI that can save nearly BD 50,000 per year.

17. **Reduction of "Waiting Lists" in SMC and Redirection of Primary Care Patients to Appropriate Health Centre.** Potential savings of BD 59,000 per year.

18. **Reduction of Responding Time for Water Meter Repairs.** A team in the Ministry of Water and Electricity found ways to reduce the time required to fix water meter faults from 18 days to 1 day.

19. **Reducing Unnecessary Admissions due to Febrile Convulsions.** This project identified new criteria for admissions that can save the MOH BD 35,000 per year.

20. Reduction in Length of Stay Following Tonsillectomy. Potential cost savings of more than BD 100,000 if recommendations are fully implemented.

21. Other projects have examined such problems as excess length of stay of neurological patients (possible savings of nearly BD 100,000); increased conformance (from 11% to >95%) of procedures in Directorate of Organization and Manpower in CSB; improvement of treatment of asthmatic patients in health centers (no financial data available yet); improved filing of discharge summaries at BDF (no financial data available yet); and shortened delivery time, improved working conditions, and reduced chemical consumption in the Central Sterilization Services of SMC (no cost data yet).

Potential cost savings as a result of the above examples may be as much as BD 1,000,000 annually!

In 2002, a survey was conducted by Amina Abdulla, the Ag Director of Training to determine the percentage of course participants who had actually implemented their projects as planned. It appears that perhaps as high as 80% of projects have been implemented, at least in part. Some of the perceived benefits included the following:

- Savings in time and money
- Improved services to patients and staff
- Improved communication
- Improved quality of work and productivity
- Reduced workload
- Improved staff motivation
- Better coordination with other departments and ministries

Unfortunately, not all projects were implemented as planned. Some of the reasons for these failures include:

- Budget problems
- Project was only completed to receive the Diploma
- Supervisors not supportive or interested
- Lack of planning

The Diploma in Healthcare Management is a practical, hands-on program that teaches participants techniques that can be used to increase effectiveness and efficiency of the organization's services and outcomes, especially regarding ability to perform Continuous Quality Improvement. As one participant wrote in a recent evaluation, "We are enjoying the full benefit of this important project. I wish we had learned about CQI much earlier."

Dr. Steve Benjamin, Director
Center for Quality Improvement and
Lecturer in the Healthcare Management Program

Healthcare Management Program
Process and Selection Criteria

Introduction

During the past seven years, the Healthcare Management Program which is jointly conducted with the Royal College of Surgeons, Ireland, and the Ministry of Health, Bahrain has interfaced several changes for the purpose of continuous quality improvement.

Like most educational institutes, the Ministry of Health started to encourage the acceptance of potential candidates into the Healthcare Management Program. This arose from the growing need and concern about the rapidly changing environment, technical advances and growth in information and national need to enhance the competence and performance of all future leaders and management team.

One of our challenges at the Training and Development Section, of the Directorate of Training is making appropriate selection of candidates. We strongly believe that accurate and complete information about the recommended applicants for the course, mainly regarding the skills , attitudes and readiness to join the program, will enable us to assess the applicants ability . Therefore, a decision was made by the H.E The Undersecretary, Dr. A. Aziz Hamza to develope a policy statement establishing a selection process and developing criteria to enhance targeted and structured information to allow us to make appropriate decisions.

The Need for the Policy Statement

It was recognized that the policy was needed in order to gain candidate commitment for personal development and organization benefit leading to cost effective resources.

Criteria for Selection and Acceptance as appeared in the circulated document by H.E The Undersecretary, Dr. A. Aziz Hamza.

1. Candidate should be senior or from mid level supervisory group.
2. Carries responsibilities related to executive, management and supervisory nature.
3. Should prove evidence of English language ability.
4. Recommended by direct supervisor.
5. Candidate should respond to the Esque article and note his/ her personal comment. .
6. Candidate should prove commitment by signing the learner contract.
7. Candidate should pass a personal interview.

Criteria for Passing the Foundation and Diploma Requirement

1. Candidate must receive at least 60% overall score for the foundation course.
2. Must attend all sessions promptly and participate actively, maximum of one day may be missed.
3. Must submit projects on time, late submission will cause reduction in grade.
4. Resit for exam is allowed only once.
5. Failure to complete any of the four modules, the candidate will be responsible to pay back the fees accordingly.

Foundation couse = 400 BD
Ieadership module = 200 BD
Planning and controlling module =200BD
Organizing module = 200BD

Steps of Enrollment and Selection Process

1. Every November of each year, a letter is forwarded to all AUS's informing them about their employees who completed the program. In addition, they are requested to recommend at least 5-6 potential candidates from their areas of responsibility and in priority order to join the program.
2. Upon receipt of the list of recommended nominees, a general list is prepared without excluding any name.
3. A letter is directed to each candidate, requesting them to submit their CV's and to write a one-page personal response to statement of a selected article related to management and leadership.
4. Upon receipt of CV's and personal response, the Head of Training and Development checks all CV's and carefully analyzes candidate's response to the Esque article. Accordingly, a final list of 30-32 candidates who meet the criteria is prepared for further discussion with the AUTP. A second list is also prepared as ready candidates for the following years. A third list is prepared justifying the reasons for rejected applications.
5. A meeting is arranged with AUTP chairmanship and the presence of Director of Training and the Head of Training and Development to discuss readiness of candidates and equal distribution of seats.
6. A final list is prepared and forwarded to his Excellency, the Minister of Health for approval.
7. Upon the approval of H.E the Minister of Health, almost all candidates are informed in writing as being accepted or short listed for the following year. The rejected applicants are notified with reasons for rejection.

Layla Al-Asfoor
Head, Training and Development
Directorate of Training
Ministry of Health

Improved Health

A Plan to Reduce Serious Ocular Injuries

Introduction

Eye injuries constitute an important cause of morbidity in Bahrain, reflecting increasing literature reports of the same from other parts of the world. A retrospective study of eye injuries requiring hospital admission for 5 years during 1988-1992 in Salmaniya Medical Complex (SMC) revealed that there were 489 cases - 442 (90.4%) male and 47 (9.6%) female. Of these, 470 (96.1%) were unilateral eye injuries and 19 (3.9%) involved both eyes. Children under 20 years of age constituted 41.3% of the total cases, the male/female proportions among them being 85.1% and 14.9% respectively. 38% of all injuries were related to occupational exposure, particularly among industrial and construction workers. 14.6% of all cases ended up in blindness or severe visual impairment, while 28.6% of cases with ruptured globe had a similar outcome. Adequate preventive measures are necessary to minimize the risk of ocular injuries at home, the playground and the work environment among the population at risk in Bahrain.

Goals

1. Reduce the number of serious eye injuries in Bahrain by 33% within 5 years.
2. Reduce serious occupational eye injuries in Bahrain by 50% within 5 years.
3. Reduce serious eye injuries among children in Bahrain by 30% within 5 years.

Strengths and Weaknesses

A major strength of the program is that sight-saving is supported by the community, health providers and authorities, in general, as prevention is better than cure. Eye injuries can result in blindness, causing tremendous economic loss to the individual and the society.

The weakness of the program is that children involved in eye injuries are not acquiescent to safety precautions; and prevention and cultural, socio-economic and education barriers impede successful, preventive programs.

Data to Support and Clarify the Target

Based on the study conducted, the plan calls for a reduction of serious eye injuries by 33% in the coming 5 years.

- The largest number of eye injuries occurred among children, 202 out of 489 cases. Our plan is to reduce these by 60 (30%) cases out of 202 in the coming 5-year period.
- The next largest group is occupational injuries, 186 out of 489 cases. Our plan is to reduce these cases by 93 (50%) in the coming 5-year period.
- We plan to reduce the remaining 101 cases by 10 (10%) in the coming 5-year period.

The total achievable reduction will be 163 cases out of an estimated 500 cases in the coming 5 years.

Alternative Solutions

1. Integration of eye injury prevention as part of the general injury prevention program.
2. Integration of eye injury prevention/treatment as part of the primary eye care program.
3. Training and education of eye care providers at the primary care level as to the causes and prevention of eye injuries.
4. Ban manufacture, entry and sales of harmful toys that do not meet safety standards.

5. Program of awareness for industrial workers regarding the prevention of eye injuries.
6. Provision of primary eye care and emergency intervention at industrial sites.
7. Introduction of safety practice in school curriculum of all levels.
8. Provision of safe playgrounds and sports facilities for children in the schools and neighborhoods.
9. Production of videos about occupational eye hazards to be shown to workers in their language.
10. Training and educational activities of paramedics, teachers, social workers, volunteers and students on preventing eye injuries.
11. Selection of devices/machinery with proper safety characteristics to be operated by workers.
12. Proper lighting conditions of the work place.
13. Selection of workers with proper eyesight for jobs.
14. Use of protective goggles for work and sports.
15. Proper maintenance to ensure safety of machinery and devices.
16. Proper handling/storage of chemical compounds such as acids and alkaline solutions.
17. Use of safety belts in cars, etc.
18. Appropriate legislation and law enforcement of safety standards in industries.
19. Supervision of young children by mature adults at home, schools and play grounds.
20. Safekeeping of sharp objects such as knives, forks, etc., out of reach of children.

Plan of Action

It is unlikely that all the above alternatives can be implemented within 5 years due to resource limitations and other barriers, so each alternative was evaluated according to feasibility, cost-effectiveness, acceptability, time to implement and availability of organizational support. Based on the highest score, ten items were selected for action:

A working group consisting of all concerned parties should be established to further develop the action plan.

Item No.	Who will Implement	Time	Resources
1	Injury prevention working group, MOH	Immediate	Available
2	Primary care, HC; Eye Dept, SMC	Immediate	Available
3	Primary care, HC; Eye Dept, SMC	2 Years	Available
10	Directorate of Training, MOH; Ministry of Education; NGO's	2 Years	To be worked out
11	Ministries of Commerce and of Industry; Occupational Section of Public Health, MOH	3-5 Years	Available
14	All Industries; Occupational Section of Public Health, MOH	2 Years	Available
17	Traffic Department	Immediate	Available
18	Ministries of Legal Affairs, Commerce, Industry and Health	2-3 Years	Available
19	Community	3-5 Years	Available
20	Community	3-5 Years	Available

Monitoring and Evaluation

The number of cases should not exceed 16 cases every 3 months, since our goal is to reduce the number of cases by 33%. At present, we have found 25 cases admitted for treatment. Every case will be evaluated individually to find its cause, which item of the plan it relates to and where we have failed to prevent the occurrence of the injury.

Data on the number of eye injury cases admitted in SMC will be collected by the Ophthalmology Department every 3 months and progress and efficacy of selected action items will be evaluated by the working group every 6 months, providing feedback and directions for necessary action/change to accomplish established goals according to the time scale of the project.

Dr. Ahmed Abdulla Ahmed
Assistant Undersecretary for Training and Planning
Ministry of Health

Quality Care Improvement Of Asthmatic Patients In Family Practice Residency Program

Introduction

Asthma is a common disorder affecting up to 5 - 6% of the world's population. Three quarters of all adults being admitted to hospital with acute severe asthma could have had the admission prevented by different prior care.

In Bahrain there is no available registration system for asthmatic patients, and the prevalence is unknown; although there are an increasing number of patients being observed in primary care. The only available data was the SMC admissions and discharge diagnosis:

	1995		1996		1997	
	Adult	Children	Adult	Children	Adult	Children
Total No. of admission	217	306	220	260	267	306
% of admission in Medical & Pediatric Depts.	3.3%	6.7%	3%	5.5%	3.5%	5.9%

The rate of asthma according to SMC discharges was 92.4 /100,000 for adults and for children there was 164/100,000 according to 1991 data. Bronchial asthma was among the top 20 conditions and accounted for an excess of 2000 days of care that has a lot of burden on the hospital budget. An audit was carried out in 1996 by the program tutors, and residents found that there were 165 cases of asthma which constitutes 1.4% of the total registration to FPRP residents.

Problem Statement

As a result from the previous audit carried out on asthmatic patients, and from our observation, asthmatic patients are not having proper agreed guidelines in their management among our doctors; and there are still a lot of cases receiving nebulizer when they are attending the clinic (65%), which might indicate that they are not under proper control.

Aim of the Project

To reduce the percentage of asthma patients returning to the health center in acute exacerbation of the system from 65% to 30% by Dec 2000.

Root Cause Analysis

The team found that residents felt that they lack some of the skills needed for implementing the proper management plans and follow-up which was exacerbated by the unavailability of nurses and health educators in the center. The problems also lay in the lack of resources essential for the implementation and absence of regular clinic audits to assess the improvement. Under use of spacers for management from doctors and patients (2%) and under use of home monitoring peak flow meter for the diagnosis of asthma (20%) showed that there were no clear guidelines for asthma patients. The hesitancy of doctors to prescribe oral steroid inhalers, over reliability on bronchodilators, and unavailability of high dose inhaler steroid also resulted in under treatment of the case. It was also found that 80% of patients used the inhaler incorrectly.

Solutions and Implementation

The following solutions were suggested to improve the quality of care for these patients:

- Identify all cases, registering them in the logbook of the resident and entering them in the computer.
- Train the residents on how to use British guidelines in stepwise management and continuous supervision by the tutors to insure their proper use of guidelines.
- Modify the available Irish checklist and ensure its use for every visit.
- Educate the patients and encourage them to use spacers and practice self-home monitoring by the use of peak flow meter.
- Encourage and increase the awareness of regular follow-up visits.
- Improve communication and cooperation with hospital physicians for those recently discharged patients.

Information about the exact total numbers of asthmatic patients attending the resident catchments area were identified by the final year residents based on previously marked files, logbook and nurse registration book. The Irish asthma record sheet was modified by the department tutors and tested on the patient during their follow-up visit and enclosed in all files of the patient. A training course for 4 days has been carried by the department tutors for all program residents, concentrating on the use of British guidelines, etc. Patient's instruction sheets were developed and given to the patients and their families to improve their information and provide proper education about the condition and self-management. Patients were given Peak flow meter home monitoring graph to encourage them to participate in their management.

Results

Implementation of the plan started from October 1998 and the initial result shows that the awareness, and understanding of our residents toward the new strategies of asthma care has improved a lot and even mastered. The patients seen by the residents during this period were given enough time for explanation, education and emphasis on the need for continuous follow-up. Some of the problems noticed dealt with issues of incorrect telephone numbers, which were discussed with health center administration. An asthma register is needed to facilitate communication, organization and audit cycle in order to implement changes; and an increase in manpower is needed to implement the strategy.

Recommendation

The need for involving the health center team (primary care doctors, nurses, pharmacist, community nurses, clerks) was an important step to start with; and it could have been overcome by proper time management and improved communication, with the general goal aiming to improve care for every asthmatic attending the health center, as well as our residents catchment's area.

Dr. Ebtisam Fakhro
FPRP Tutor
Directorate of Training
Ministry of Health

Family Planning in Primary Health Care

Introduction

Family planning is an essential part of Primary Health Care (PHC). It aims at the well-being of the family by promoting spacing of birth, whereby the mother can have a child when she wants to have it; and a child will be looked after with care. Our Goal is to increase utilization of Family Planning from 16.7% to 20% by the year 1997.

Strong Factors Which Contribute to the Implementation of Changes

- Availability of FP program and the presence of family physicians in every health center.
- Cost free service provided by our Government to all Bahraini citizens
- Life and health care awareness among the people of Bahrain.

The Weak Factors Working Against Implementation of the Plan

- Acute shortage of health
- Non-Availability of MCH clerks in Region 4 compared to other regions
- Accuracy of data collection and information analysis
- Absence of team work in some areas
- Hesitation and uncertainty among clients (feedback from questionnaires)

Steps Taken to Create Changes (Tactical Plan)

The first meeting of the group chaired by myself with the MCH Supervisor from Region 4, was held on 16th June 1995, to discuss a tactical plan and its implementation as follows:

MCH Computerization
Family Planning utilization in Region 4

The role of the MCH Supervisor was set as follows:

1. To organize a group within the health centers, consisting of the MCH Supervisor as leader, MCH Nurse and Health Educator, whose role was to explain the plan to doctors working with her to emphasize the Family Planning Program.
2. To make sure that the follow-up sheets are available with the doctors in the consultation rooms.
3. No contraceptives are to be dispensed without the PN/FP stamp, so that clients will be directed to the MCH section for registration and stamping.
4. Ensure follow-up visit is with physician according to the follow-up sheet which should be in the patients' files.

Discussions with the concerned MCH supervisors revealed that they understand the need for changes, but the following points needed to be addressed:

1. Registration was not done properly by community health nurses
2. FP sheets used for the first visit examination were not used for old users (in all HCs)
3. Pharmacists were not directing women to the MCH section for registration (Hamad Town HC)
4. A questionnaire was distributed in the health centers of the region to assess family planning utilization.

Dr. Amal Al-Jowder, Head of Health Education at the Ministry of Health, attended the second meeting of the group, and the following actions were agreed upon:

1. Health Educator to design an appointment form to be distributed among doctors and MCH sections
2. A Register book to be designed to include: name of patient, CPR, File No., Number of pregnancies, current contraception, period of usage, reason for discontinuation, alternative, 1st visit education, re-visit.
3. Statistics to be checked by MCH supervisors at the end of each month.
4. Posters will be designed according to the result of the study/analysis.
5. A meeting was held with individual MCH supervisors and health educators to explain the above points regarding health education initiatives.

MCH Computerization

Entering MCH statistics through computers started in 1995. Though in the beginning staff were not utilizing the computer appropriately, MCH staff now seem to be seriously considering computer utilization as part of their daily work.

At the meeting held with the previous regional administrator to discuss poor utilization of the computerized system in East Riffa HC, it was agreed to allocate one clerk to work in the MCH section for two hours a day except on Saturdays. Unfortunately, it was found that this has not been successful because the clerk supervisor kept shifting him to different health centers. Corrective action also needed to be taken on issues regarding increased work/data input at E. Riffa and Kuwait HC, which were raised during a meeting with the MCH supervisors.

Following meetings held with the regional Nursing Officer and MCH Supervisor and staff at East Riffa HC to find alternative solutions to the problem, we agreed to allocate one practical nurse to work on this project to enter all data needed by the end of the first quarter of 1996, with frequent monitoring by MCH supervisor at that health center.

Implementation

Implementation of the plan is expected to be completed by 1997 with an estimated time of one year for input of information/data.

Dr. Farha Al Kawary
Region 4 Medical Officer
Health Centers Directorate
Ministry of Health

Administration of HBV Vaccination to All Staff Working in PHC and PH

Introduction

According to documented literature on Hepatitis B vaccination, the prevention rate is about 90% and the immunity rate in the blood is 98%. It is therefore very important that every health worker at risk in Primary Health Care and Public Health Laboratory is given Hepatitis B vaccination.

Problem Statement

While making my routine rounds in Health Centers, I discovered that more than half of health center workers did not have their HBV vaccination, and those who did, had not completed the required three doses or had done so between long intervals, which may result in negative outcomes. I informed the Infection Control Committee accordingly and recommended that they initiate an action plan to administer the HBV vaccination to all staff at risk. A study was conducted through those in charge of each section/department, to find out the coverage of the vaccination in Health Centers in January and February 1994, the number of those who completed their three doses, those who received only two doses and those who did not receive any.

A plan was put into place with the Head of the PH Laboratory and the Chief of the HC laboratories, where the blood would be collected from those who, despite having completed three doses, had been tested for Hepatitis B Surface Antigen Antibody (HBsAG) (if the indication of the rate is less than 10, it is considered as a negative result, and if the rate is 10 and above, it is considered a positive result).

Changes Required

1) Goal

To administer Hepatitis B Virus vaccination to all PHC and PH Laboratory staff (from December 13, 1994 to June 13, 2000), for those who did not complete their vaccination previously, those who did not receive the vaccination and those whose blood results are negative for Hepatitis B Surface Antigen Antibody (HbsAG) after blood test.

2) Force Field Analysis to identify the force for/against change

(a) Forces for change that caused re-engineering of the HBV immunization program: There is a strong need for administration of HBV vaccination and the fol lowing forces support it strongly:

- The number of needle/sharp injuries has increased from 1993 to 1995, indicating that all health workers are at high risk:
  Oct-Dec 1993 - 5 injuries
  Jan-Dec 1994 - 22 injuries
  Jan-Oct 1995 - 20 injuries
- Only 284 out of 613 health workers received three doses of HBV vaccination, which were not administered according to proper timing and route. Out of the 284 who received three doses of HBV vaccinations, only 121 were positive for HBsAG.
- All categories of health workers are at risk, especially nurses.
- Improper handling of sharp materials. Universal precautions are not applicable because of the shortage of hand-washing facilities, gloves, aprons, eye protection and masks.

- Infection control manual states clearly that sharp/needle prick injury policies are the responsibility of each person from the victim to the doctor in-charge for administration of HBV vaccination.
- Infection Control Committee supports the idea strongly and pushes it forward.
- Provision/availability of required/adequate number of vaccines in drug store, ready for use. Availability of adequate supplies of needles, syringes, cotton and spirit in each health center.
- Willingness of staff to follow guidelines.
- Workshops on sharp/needle prick exposure to increase manpower awareness and knowledge.
- Cooperation of the Maternal and Child Health Section in administering and recording of the vaccination.

Resistance Against

- Resistance from some PHC workers due to wrong information given to them previously.
- Documentation process, which should be covered by the Infection Control staff.
- Some of the staff's blood results were either not received, or they were not checked.
- Nursing Officers refused the change because this will increase the workload in the Maternal and Child Health Section.

Organization of Teams

Using Belbin's Team member characteristics to direct and implement the change, teams of four persons were established to implement the following changes:

- The team discussed the idea with the Infection Control Committee, and the plan was put forward for implementation by the Infection Control Supervisors
- Calls were made to all CHN's in all health centers to inform them of the change.
- A circular was issued to all departmental heads, supervisors, in-charges, and staff, notifying them of the change.
- The Chief Pharmacist was requested to allocate/provide required quantities of the HBV vaccine to health centers.
- Provision of adequate supply of all other materials, ie. needles, syringes, etc.
- Pharmacy in-charge were informed about the provision and number of vaccines at the drug store.
- All types of infection control forms which are used to record vaccine administration were sent to the CHN's .
- Staff names were registered in the vaccination request form sent to CHN's to accomplish vaccination schedule for the 1st, 2nd, and 3rd doses, and enter blood test results when completed.
- A schedule for the 1st and 2nd dose was sent to inform all staff about the date and time of the HBV vaccination for all health centers.
- A vaccination program and new schedule will be arranged for new staff who join the Directorate and PH Laboratory and those who are newly trans ferred.
- Workshop on sharp/needle prick exposure to increase manpower awareness and knowledge was conducted on 23 October 1994, along with a lecture about the HBV vaccination as a first line protection.
- All the above actions were implemented from 15th October to the end of

November, prior to the vaccination time to ensure that information was conveyed to and accepted by all staff
- Head of PH Laboratory was informed about blood tests and indicated his acceptance
- All PHC laboratory staff were informed about blood collection at PHC laboratory and tested in PH Laboratory.

Implementation of the Plan Through Teamwork

Implementation of the vaccination program for the three doses began on December 13, 1994, first in Region 1 and 3, followed by Region 2 and 4. Using immunization cards and consent forms helped in following up on administration of the second and third doses. The program ran smoothly and was accomplished under the supervision of the team members.

Outcome of the Change Management Activities

After evaluating the program using the monitoring steps documented in the planning project, the following results were noted:

1) Vaccines were provided and distributed in all health centers.
2) All materials were provided in the health centers.
3) 360 health workers were immunized against HBV (all three doses were given).
4) Blood tests were carried out for 283 staff for HBsAG (for those who com pleted their vaccinations). Blood tests for HBsAG showed that 121 proved positive.
5) All three doses of the vaccine were administered.
6) The registration process took place in all the forms and evaluated accordingly.

Ineffectiveness

After completing the third dose of the vaccination, some of the health workers were still found to be HBsAG negative. While this could happen because of several factors affecting immunity/resistance and can differ from person-to-person, they will need to have another course of the vaccination, which has been initiated.

Teamwork and cooperation resulted in a successful completion of the immunization program within the target dates. Through teamwork, we came to know the strategy of planning, organizing and the successful achievement of specific targets.

Mrs. Fatima Abdulla Al Jeeb
Nursing Officer
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Health Centers Directorate
Ministry of Health

National Program to Control Iron Deficiency Anemia in Bahrain

Introduction

The importance of nutrition for the welfare of the population of Bahrain has been well recognized. In February 1981, when the Ministry of Health established the Nutrition Section in the Public Health Directorate, there were only two nutritionists. Today there are six highly qualified nutritionists to improve the nutritional health status and provide healthy and safe food to the community, which is one of the main aspects of essential health care.

Strategic Goal

The Nutrition Section recognized its role in achieving the above goal, and its objectives were specifically defined as follows:

1) Define, assess and analyze nutritional problems.
2) Participate and cooperate in the establishment and operation of a food and nutrition surveillance system.
3) Promote multi-sectorial food and nutrition strategies and programs.
4) Participate and cooperate in the implementation of the above strategies and programs.
5) Establish nutritional related legislation, policies and standards.

A group consisting of the Head of the Nutrition Unit, the Director of Public Health, Maternal and Child Health Coordinator, Nutritionists and the Advisor from Bahrain Flour Mills Company set out to study and review the following issues:

1) The prevalence of iron deficiency anemia among vulnerable groups in the community, i.e., pregnant, lactating women and children below 5 years of age.
2) WHO and UNICEF guidelines for the eradication of iron deficiency anemia, highlighting the areas of agreement and propose appropriate action.
3) Compile the view of the group for future direction of the work.
4) Propose a framework on implementation of a plan of action.

The group studied the results of the latest national survey that revealed iron deficiency was detected in 40% pregnant women, and 47% of children below 5 years were found to be anemic; and accordingly, the group set out a strategic goal- "Reduce Iron Deficiency Anemia among pregnant, lactating women and children below 5 years of age by 15% by the year 2001".

Tactical and Operational Goal

The following tactics were adopted to achieve the strategic goal:

1) Food and Nutrition Education program
2) Target Group Supplementation Program
3) National Fortification Program

The first two programs are currently implemented through primary health care, but the third program has not been applied as yet; and as a group, we decided to think about the operational plan for the third program.

National Fortification Program

Food fortification is the addition of one or more nutrients to foods; the main objective is to increase the level of consumption of the added nutrients to improve the nutritional status of a given population. The primary role of food fortification is the prevention of deficiency, thereby avoiding occurrence of disorders that lead to human suffering and socioeconomic disadvantages. Food fortification can also be practiced to eliminate and control dietary deficiencies and their disorders as follows:

1) To correct a demonstrated dietary deficiency of those nutrient(s) that are added.
2) To restore nutrients initially present in significant amounts in a food but lost as a result of food processing and manufacturing.
3) To increase the nutritional quality of manufactured food products that are used as the sole source of nourishment, e.g., weaning foods.
4) To ensure nutritional equivalency of manufactured food products substituting for other foods, e.g., fortified margarine as a substitute for butter.

Correcting iron deficiency anemia through iron fortification of the diet is considered to be the cheapest strategy to initiate, maintain, reach the largest number of people with a relatively small effort, and if correctly planned and conducted, is well accepted. Since food habits are difficult and slow to change, food fortification is the most direct and efficient approach to increasing dietary intake of iron; and it has proved to be the best long-term approach. Iron fortification does not have the gastro-intestinal side effects that iron supplements often induce and is a major advantage in terms of consumer acceptability and marketing of iron-fortified products.

Operational Plan in the Development of the Iron Fortification Program

1) Determine the prevalence of iron deficiency anemia among pregnant women, pre-school and school children, adults and the elderly.
2) Determine the dietary iron intake from a dietary survey among pregnant women and national nutritional survey.
3) Obtain consumption data for potential vehicle. The most suitable vehicle commonly consumed by different age groups, and socioeconomic levels is "Flour".
4) Seek the support of Ministry of Health policy makers and legislators.
5) Form a National Fortification Task Force with members from the Ministry of Health (Nutrition Section and Legal Advisor), Ministry of Commerce (Standards and Metrology Directorate), Ministry of Finance, Private sector (Bahrain Flour Mills Company), Academic and Scientific personnel, NGO (non-governmental organizations), and women's associations.

Alternative Solutions

1) Identify mechanisms for collaboration between national government, food industry and its marketing system, and NGOs.
2) Assist in the identification of appropriate iron compound and food vehicle.
3) Identify limits of the fortification.

4) Identify other possible micronutrients to be added, e.g., folate.
5) Calculate the cost/effectiveness ratio of such a scheme.
6) Define and develop quality assurance system.
7) Participate in promotional and educational efforts to reach the target population.
8) Government regulations and standards have to be established before the program can be implemented (March 1997).
9) Pass legislation at the highest possible level (April 1997).
10) Implementation of the program together with marketing campaign (June 1997).
11) Follow-up, evaluation and monitoring should be started once the program is implemented; and it is an on-going process.

Implementation

Certain steps of the operational plan have been implemented as follows:

1. The prevalence rate of Iron Deficiency Anemia among vulnerable groups and consumption data has been determined.
2. Necessary discussions and meetings with Nutritionists, Ag. Director of Public Health Directorate, Maternal and Child Coordinator for Primary Health Care and Milling advisor from Bahrain Flour Mills Company.

However, the other operational plans will be implemented according to the proposed target date.

Self Evaluation

As leader of the activity, I think I have done a fairly good job successfully working with the group of people in achieving the strategic, tactical and operational plans. However, at this stage, I cannot evaluate myself in convincing the higher policy makers in the Ministry of Health in formulating a "National Fortification Task Force" to implement the program.

Dr. Khairiya Moosa
Head Nutrition Section

Periodic Women Examination in Kuwait Health Center

Introduction

Bahrain has made great progress in different areas, including health care, with health care services available any time of the day or night. Primary health care is available for everyone with twenty one health centers providing a variety of services. One of the services available in the health centers is Mother and Child Health (MCH) care, which plays a major role in child screening, immunization, antenatal and post- natal care, premarital counseling, family planning, periodic examination and breast examination. Statistics for MCH in Kuwait Health Center (KHC) over the past ten years show that we reached a 98% coverage for immunization and antenatal care in 1999.

Unfortunately, the attendance rate for periodic women's examination is low compared to other services offered in MCH, partly due to the fact that not many women are aware of the importance of the types of screening such as:

1. Cancer of the cervix: Early detection has a greater success/cure rate of 95%. This test is easy to perform with little discomfort to the patient and can identify 80-90% of lesions long before the development of invasive cancer. Women 20-40 years old should have the test done once every 5 years, women more than 40 years old once every 3 years, and women at high risk every year. The high risk groups are:
   - Women with cervicitis not responding to treatment.
   - Women on hormonal contraceptive pills.
   - Presence/history of papilloma virus or herpes simplex infection.
   - Sexual intercourse before the age of 20.
   - Sexual intercourse with male partner who has multiple partners.
   - More than 2 sexual partners in a lifetime.
   - History of smoking.

2. Cancer of the breast: Women are taught to do breast self-examination especially if having a history of fibrocystic disease. More than 90% of breast cancer are currently detected by patients themselves and breast self examination should be done monthly from the age of 20. The high risk groups are:
   - Nulliparous.
   - History of menarche.
   - History of pregnancy above 30 years of age.
   - History of previously treated breast cancer.
   - Family history of pre-menopausal cancer in mother or sister.

3. Detection of abnormality or infection.

Goal

To increase the number of women who undergo periodic women examination in KHC from 24-28 monthly to 34-40 monthly by the year 2000.

Operational Plan

To achieve this objective we need to implement the following action plan:

- Create a team of Doctors, Community Nurses and Clerks.
- All doctors should be instructed to check whether women patients have undergone the periodic examination, the date of the last examination, arrange appointments if the patient is willing and instruct the patients on preparation for the examination. If the patient is unwilling, then involve health educators to explain and educate the patient.
- Nurses to arrange appointments for women aged over 35 who visit MHC.
- Special stamp to be put on prescriptions of women over 35 years of age visiting KHC to indicate that they need to do the periodic examination.
- Conduct research/analysis on the causes of non-attendance.
- Expand health educational program to include husbands, stressing the importance, advantages and disadvantages of the examination, remove obstacles preventing patients from attending the examination, prepare educational films, distribute brochures, articles and posters on the subject, involve religious organizations, schools and community services in spreading awareness.
- Involve young girls from the area (KHC) in our activities by training and educating them to visit defaulters and convince them to attend the clinic and helping spread awareness of the issue among their friends, neighbors and family.

Resources

To implement the plan we need:

- To Meet with social leaders to discuss the plan and arrange transport for patients, distribute educational material, lectures in matams and social clubs and encourage women to have the periodic examination done.
- Computer for registering details of all ladies in KHC area, check the number of visits, check for defaulters and register laboratory data to enable us to keep up-to-date on our statistics and records.

Dr. Latifa Abdulla Al Hamad
Doctor In-charge
Kuwait Health Center

Reducing the TB Incidence in Bahrain

Problem Statement

The incidence of TB in Bahrain is about 26 per hundred thousand population for the year 1996; and our goal is to reduce this incidence by 25% by the year 2000, by increasing the detection rate to 90% and improving the cure rate by 95%.

The Gulf States have a large population of expatriates with high TB prevalence and considerable percentage of notified TB cases among them. According to 1996 statistics in Bahrain, the Directorate of Public Health was notified of 158 TB cases, which include both pulmonary and extra pulmonary TB, of which 68.6% of them are expatriates. The prevalence rates are:

Age group in years	Prevalence (%)
0 - 14	3.9
15 - 54	83.3
> 55	12.8

It is essential for Bahrain to develop a standard management approach to the problem among expatriates.

Root Cause Analysis

The source of TB in Bahrain and Gulf States is mainly from the expatriates that come from endemic areas. It occurs mainly among laborers due to certain reasons: poor living conditions, over crowding, no proper hygiene and low income. Nutrition may not be adequate, resulting in reduced immunity and resistance to infection. Infection can be transmitted very easily among them, which could easily infect their Bahraini contacts.

We have to concentrate our activity on conducting immediate medical investigations on expatriates as soon as possible (at least three weeks) after their arrival in the country. The old policy in place at the moment states that all expatriates must be investigated within 3 months after arrival in the country; which is too long, as they may have already spread the disease.

When an active case is discovered, we have to examine everyone who came in contact with that person to discover the source of infection or other +ve cases.

Solutions and Implementation

Suggestions were raised at the Respiratory Disease Committee meeting and plans discussed and agreed upon; and the issue was forwarded to the planning section in the MOH to take action and formulate a policy with cooperation of the Ministry of Interior. Expatriate laborers who decide to come to Bahrain for work should have a medical fitness test for TB and other communicable diseases in a recognized medical center or hospital in their country of origin before being given an entry visa to Bahrain or GCC countries.

An alternate solution was to do a Minute Mass Radiography X-ray (MMR) as soon as they reach the airport, and suspected cases should be referred immediately for check-up.

A new policy should be implemented to investigate laborers and expatriates within three weeks from their arrival in the country and not within 3 months as the old pol-

icy says. Also, screening should be done using PPD, as well as CXR to prevent false readings.

The matter was also raised at the National TB Committee for further action to be taken.

Results

No action has yet been taken by the MOH regarding investigating the expatriates in their country of origin or taking minute CXR in the airport during arrivals.

The only action taken now is investigating the expatriates within 3 weeks from their arrival to the country by CXR and PPD test in Al Razi HC.

Recommendations

We have to insist that the new policies and procedures be implemented, and cooperation with other GCC countries should be increased and standardized regarding this matter.

The new situation and follow-up should be maintained, and policies should be constantly updated and followed up.

Dr. Mahdi A. Hassan
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Salmaniya Medical Complex
Ministry of Health

Child Monitoring in Primary Health Care

Introduction

Health Centers in Bahrain are distributed throughout the Kingdom of Bahrain, providing a variety of services such as curative, preventive, family-oriented and community health services, and maternal and child health care servises, which are easily accessible to all residents on the island. Child Health Care Services include immunization and monitoring of growth and development of children from birth to 6 years of age.

Problem Statement

Although all MCH sections provide timely growth monitoring and frequent visits for children of different age groups, staff still discover sporadic cases of severe nutritional problems such as failure to thrive (FTT), rickets, and obesity. Many children show deviation of growth patterns whether underweight or overweight for height, but no early intervention is provided. In fact, staff intervene at a later stage when the problem is obvious and severe.

The Bahrain family health survey (BFHS) conducted in 1995 using the cut-off point for malnutrition suggested by UNICEF, showed low prevalence for stunting - 10% (<20%) and median prevalence for wasting - 5% (3-7%) and low prevalence for underweight - 10% (<15%). National Bank of Bahrain (NBB) was chosen for a pilot-project to study patterns of growth, dietary intake and types and timings of intervention since birth. According to the data collected from child screening booklets, results showed that 66.6% are either over or underweight for height, and no early interventions were provided to prevent long-term complications, while interventions were specifically targeting only severe, obvious cases.

Root Cause Analysis

The root cause of the identified problems is the delayed intervention by concerned personnel. Staff felt that mild growth deviation is too early to intervene, and doctors do not always look at the growth charts. In a few cases, plotting growth charts and measuring growth parameters were doubtful. Staff were reluctant to inform parents about the problem at the early stages, and they were not sure about the dietary intake to be advised for children below 6 years of age.

Solutions and Plan for Implementation

- Using brain storming techniques in several meetings, it was decided that the approach should be multidisciplinary.
- Increasing staff sensitivity to read at early stages and intervene.
- Continious training programs for staff and setting guidelines for quality and quantity of dietary intake of children 0-6 years.
- Health education campaigns for the community in local women's and other organizations on proper feeding and the importance of early intervention and prevention of growth deviation.
- Guidlines for Hb screening (0-6 years) for health center staff, F.T.T., obesity, and rickets, and

- Continuous supervision of MCH staff involved in growth monitoring and plotting growth charts.

Methods Used to Introduce the Change

- Circular was sent to all doctors and nurses in NBB Health Center informing them about the program.
- Involvement of target number of staff and plan to approach private sector in the region.
- Techniques to overcome the problem were thoroughly discussed and the team decided a plan of implementation.
- The nutritionist issued written documents of nutritional needs of children below 6 years of age.
- Written policies and guidelines will be issued soon.
- A system for monitoring was decided, and some high-risk children were moni- tored to evaluate stages of intervention.

Recommendation

Proper education and training of staff is necessary to detect the problem at an early stage, and parents and other concerned persons should be informed of any abnormalities in children growth.

Dr. Nada Haffadh
MCH Coordinator
Primary Health Care
Ministry of Health

Causes of Poor Control of Diabetes Mellitus

Problem Statement

Diabetes Mellitus is not a single disease but a group of diseases, and failure to recognize this fact has caused and still causes considerable confusion. It is a chronic health problem that causes considerable mortality and morbidity, not excluding the cost in economic terms; but good control and regular surveillance for complications will enable patients to fulfill lives approaching normal expectations. Overall disability rates are 2-3 times higher than non-diabetic patients. Gangrene of the lower limbs requiring amputation is 20-30 times more common. The major risks relating to the cardiovascular/nervous system are a 4-6 fold increased risk of premature death from cardiac disease, a similar increase in cerebrovascular disease, an eightfold increase in peripheral vascular disease, and increased risk of vascular disease associated with renal failure, retinopathy and neuropathy.

Despite the restrictions imposed on everyday life for diabetic patients, it is very important to stress the potential long-term risks if glycaemic control is not achieved. Guidance and education by health care providers is important, but the key aspect in controlling the disease lies in proper self-management over a period of time since patients have a prime responsibility in day-to-day administration and management of the treatment and symptoms.

A study done in Salmaniya Medical Complex in February 1998 showed that out of a total of 1,007 visits per week, 128 (11.7%) were diabetic patients. Of the total registered population (33,378) at Naim Health Center (NHC), the total registered adult diabetic patients are 750 (2.25%) - 426 patients on oral therapy alone, 195 patients having diabetes and hypertension, 75 patients on insulin therapy alone and 17 patients with oral and insulin therapy. Physicians were informed of 23 diabetic patients on diet alone. Analysis of laboratory data on fasting blood sugar tests in May 1998 showed that 260 out of 560 requests were for diabetic follow-up of which 82% showed poor control and 18% showed good control (7mmol and below considered control).

Root Cause Analysis

A qualitative research study to discover the underlying causes of poor control of Diabetes Mellitus was conducted by the team (selected and identified from members of the Naim Health Center Council (NHCC) by Belbin's questionnaire) and a focus group was targeted consisting of male and female Bahraini diabetic patients and Non-Bahraini male diabetic patients which revealed the following:

- The patient's view identified causes such as life-long treatment, frustration/stress contributing to blood sugar levels, psychological elements, denial, lack of education on the disease, lack of knowledge on diet/exercise and difficulty in modifying lifestyle/eating habits. Three of the females pointed out that they cook for their families, making it difficult to maintain the proper diet, as they had to consider the needs of their families.
- The physician's view pointed out the fact that the disease is harder to treat than other conditions as successful management relies to a great extent on lifestyle change, which is out of their control. Their training focused primarily on the treatment of acute symptoms/conditions and not on chronic ones like

diabetes, which requires a high degree of patient participation. One physician noted that most physicians can treat conditions that require only medication well, but not many give good advice for diabetes.

- Complexity of treatment as there are more components to diabetic treatment than for other diseases e.g., medications, glucose monitoring, screening/prevention of complications, etc.
- Symptoms and efficacy of treatment of diabetes are harder to judge as they are subtle and last over a such a long period that patients are unaware of the danger and often neglect treatment recommendations. Physicians also find it harder to treat and convince patients to follow treatment, as diabetic treatment often causes pain or creates symptoms rather than alleviating them (finger pricks for glucose monitoring, injections, medications that can result in hypoglycemia, etc), especially if the patient is not experiencing uncomfortable symptoms.
- Discrepancies between physician/patient perceptions make diabetes difficult to treat as the physician considers the urgency for treatment but the patient does not.
- Time and expense are also factors that affect treatment of diabetes, as health centers and patients lack sufficient resources for comprehensive diabetic care, extra time/effort is needed from physicians and insufficient budget to provide extra staff for educating diabetic patients.
- Health care providers view is that medications for diabetic control are not as effective as patient responses often fluctuate, often increasing rather than decreasing symptoms.
- Glycemic control as each patient is different, physicians have different beliefs/attitudes/motivation and patients have different views.
- Communication between physician and patient also causes problems due to language barriers and different eating habits.
- Lack of training for health care providers in dealing with comprehensive diabetic care and diabetic crises.
- Personal characteristics of different individuals in coping with diabetes. Stress/time management abilities differ in physicians dealing with diabetic patients, some physicians neglecting to fill out diabetic sheet, etc.

Alternative Solutions

By brainstorming and discussion, the team reached agreement on the following:
1. Increase good control from 30% to 90% in diabetic patients with blood glucose levels = or < 7mmol by the end of 2000 in NHC.
2. Formulate strategy to improve quality of service by establishing diabetic clinic, screening/identifying high-risk patients, increase health education programs in schools, community, etc. Encourage DM patients to participate in Diabetic Association activities and follow proper diet and exercise habits.

Implementation

A mini diabetic clinic was established from 6 June 1998 and appointment times changed from 7.5 minutes to 10 minutes at 7:15 - 9:50 AM on Saturdays to Wednesdays. Announcements were made to all physicians and health care providers at NHC by memo and meetings, to patients by TV, radio and notices and staff at NHC were told to advise and inform patients about the clinic. The necessary equipment for the clinic was prepared, staff briefed about guidelines from WHO,

training provided for staff on diabetes, administrator appointed to ensure forms and appointment cards were available and the Health Education department was requested to prepare 500 educational booklets on diabetes. Arrangements were made for 15-minute appointments with dietician who provided patients with information on balanced diet and guidelines to be followed, and pupil dilation for ophthalmologic fundus examination was conducted. Weekly meetings were held with physicians for feedback/comments.

We found that 57 patients visited the clinic in the 1st week, 32 patients in the 2nd week and decreased further due to resistance of some physicians to accept patients referred on the same day and due to clerical errors. So it was decided to conduct the clinic on Sundays only until proper scheduling of appointments were made to ensure that all registered diabetic patients (750) visited the clinic; 100 per week, totaling 3000 visits a year, plus newly diagnosed patients.

Results

The files of every fifth diabetic patient who visited the clinic was reviewed and the results were as follows:

Item	Before establishing clinic		After establishing clinic	
	Done	Not Done	Done	Not Done
Diabetic sheet	40%	60%	100%	0%
FBS control	30%	70%	50%	50%
HbAlc Control level	80% 30%	70% 20%	100% 60%	0% 40%
Fundus examination	40%	60%	100%	0%
Ref. to eye clinic	0%	100%	100%	0%
Foot exam	20%	80%	100%	0%
Urine dipstick	20%	80%	100%	0%
Lipid profile	90%	10%	100%	0%
ECG	40%	60%	100%	0%
Blood pressure record	40%	60%	100%	0%
Weight record	60%	40%	100%	0%
Diet advice Dietician Ref.	0% 0%	100% 100%	100% 80%	0% 20%

It was also found that 80% (20% previously) of diabetic patients who visited the dietician reduced weight and 20% (0% previously) controlled FBS after establishing the clinic.

Recommendations

Continuous monitoring, auditing and evaluation of the diabetic clinic is needed as well as active involvement of staff and patients to improve the quality of service, cost-effectiveness, decision-making and other activities connected to controlling diabetes.

Dr. Somaya Al Jowder
Head of Naim Health Center
Naim Health Center
Ministry of Health

Efficiency of Support Services

Improve the Effectiveness of Interlibrary Loan Services

Introduction

Ahmed Al-Farsi Library serves a wide number of health professionals in the State of Bahrain. One of the core services is Interlibrary Loan (ILL) provided to members of the Library. ILL is the request of article(s) that are not available in the Library that could be photocopied and requested from outside sources. It is part of the literature searches done by Library staff who order the requested articles from one of the medical libraries that comprises a consortium in the Gulf Region.

Problem Statement

An informal resource-sharing consortium has existed for the past 15 years composed of medical libraries in the Gulf countries. The main objective of the consortium was to share information and documents between libraries, free of charge. However luxurious a medical library may be, it may not always be able to subscribe to all medical journals in the market. Throughout the years, documents were shared using the same traditional method; the post/mail system. Setting an Interlibrary loan request, a requester would need to wait for more than a month to receive a reply. Al-Farsi Library patrons complained of the long period it took to set an ILL request. Although ILL service was seen as a vital service for many libraries, no one in the AGCC libraries initiated a change from the current situation.

A review of annual statistics revealed an increasing number of ILL requests and transactions. Technological advances and a desire to improve brought Ahmed Al-Farsi Library to a point where we found ourselves rethinking the way in which library resources are shared between and among AGCC libraries. The advent of faster, more powerful computers, vastly improved data communication systems, and standardized data transfer protocols have all opened the door to new ways of sharing information between libraries.

The aim of this project is to re-engineer the current interlibrary loan service and reduce the number of days from more than one month to one or two days or less, within a period of six months. This could ensure patrons' satisfaction, better quality of patient treatment and increase in research productivity.

The team that was established saw this project as a core point, giving us the opportunity to plan and implement the plan with no external influence.

Root Cause Analysis

1) It takes too long to set a loan. Interlibrary requests take approximately one month to get a reply.
2) Important articles require urgent replies.
3) It costs money to send requests through registered mail.
4) Ordinary mail is old fashioned. Computer technology has forced us to unfreeze the situation in order to enter the new millennium with better service provision.
5) Reduction of periodical subscription: because print periodicals were reduced sharply, the number of unavailable articles will increase.
6) It takes a long period of time to obtain Ministry of Health approval for new software.
7) It would either require training or hiring of new employees to use the new software.
8) Cost of new equipment: although Ariel software was not expensive, hardware requirements were expensive.

9) Agreement with AGCC Libraries Consortium: other libraries must agree to use Ariel software as a method of online document delivery.

Alternative Solutions

- The first solution to reduce time consumption was to implement computer technology. It is currently used for cataloging, circulation and Medline searching. The team suggested the use of the Internet/Email system as a tool to send and receive ILL requests. This involved training of staff and provision of scanners in the Library.
- To use this as an effective tool, it was necessary to reach an agreement with the GCC Medical Libraries consortium. At subsequent meetings with directors of the consortium, the majority were not in favor of using email, while some expressed their willingness.
- Software: We considered Ariel Document delivery software as the best alternative, since users can scan documents/articles, photographs and transmit the resulting electronic images through Internet to each other's Ariel workstation.

Implementation

- The team set out to obtain approval from the Ministry, arrange for training of staff on the use of the software, agreement with AGCC medical Libraries on the use of Ariel software.
- The unfreeze process started when a request for purchase of Ariel software was introduced at the Library Executive Committee (LEC) meeting. A strong justification of the urgent need of Ariel software was presented to the LEC and was approved.
- After months of negotiation, the software has finally arrived and been installed.
- The unfreezing process began when the Library sent out circulars to all departments at SMC to inform them of the latest progress in library services.

Results

Results of a survey taken one month after installing Ariel revealed patrons' appreciation and satisfaction with the changes. It now took less than two days to receive the requested articles.

Recommendations

The following recommendations are based on the information gathered in the process of conducting the Interlibrary Loan CQI project, which was not intended to be a study of Ariel software.

- AGCC library directors recommended that the consortium should be exploring the idea of including print, audio and visual materials in the document delivery agreement.
- Efforts to encourage other Arab Medical Libraries to get involved in the resource-sharing services have paid off. Many Arab Medical Libraries have shown willingness to join the GCC Medical Library consortium
- Every effort should be made to continue the trend of delivering more articles without moving physical items between libraries. The project team has worked reasonably well though the time factor played a role in delaying many of our plans. Progress achieved showed optimism that success is always feasible if an overall effort is made.

Mr. Abbas Al-Khatem
Chief Librarian
College of Health Science

Improving Student Registration System at the College Health Sciences

Introduction

The Registrar and Student Affairs Office is one of the largest administrative offices at the College of Health Sciences. It provides services to customers both inside and outside the Ministry of Health.

One of the services that the Registrar and Student Affairs Office provides is the annual admissions process that deals with candidates from the Sciences High School Stream. These candidates are pre-screened, then screened through Entrance Examination in both English and general sciences, and then finally through a personal interview. The final scores of all three screening measures are fed into a formula to have the final decision about successful candidates. This major activity keeps the five employees at the Registrar and Student Affairs Office - including the head - very busy for about three months every year.

Background of the problem

The Registrar's Office receives more than 700 applications for screening every year based on set criteria. The number of students accepted and enrolled to study at the Ministry of Health's expense at the end of the three-month admission period doesn't exceed 100 students into the Associate Degree Nursing program. Less than 1% of the candidates do not match the criteria. The first step in improving the quality is to develop a team to serve as conductors, plant, completers, evaluators, team members, investigations and shapers.

Root Cause Analysis

In order to find the causes of the problems, the team went over each and every procedure of the admissions process in detail in order to identify the 20% of the process that needs to be changed in order to improve the situation by 80%. It was found that the 15-step admissions process was really necessary for only about 50% of the candidates. Only 3 steps were necessary for the other 50% of the candidates.

Solution and Implementation

It was found that delaying step 3 "Completing 700 application forms" and step 4 "Entering data of 700 application into the SIMS system "Would save 60% of the Registrar and Student Affairs Office staff time and effort; and would free them to attend to other important duties of the office. Moreover, delaying step 6 "Delaying Science Entrance until after English results are out" and step 9 "Entering the Sciences Entrance Examination results "would further cut out cost and time by 20% since only 1/2 of the candidates sit for science Entrance Examination. Another improvement would be to modifying step 12, "Reducing the time of the interview by 5 minutes", which is expected to reduce the total cost by 10%. It was not possible to pilot the proposed solutions due to lack of data.

Hence, the team suggested using Kotter's 8 steps of transformation of freezing and unfreezing.

Result

It is hoped that the result upon implementation of this quality improvement project will be as expected by the project team. This is an expected saving of total of BD1,768, increase in income by BD2,250 and saving one third of the man-hours required each academic cycle annually.

In terms of Dinars, the expected savings in each of the areas are as follows:

Procedure	Currently in BD/-	Proposed in BD/-	Difference in BD/-
Expenditure			
Human resources / man-hours and salaries	-2781	-1098	+1683
Printed examination papers	-100	-50	+50
Application forms	-120	-85	+35
Total Expenditure	**-3001**	**-1233**	**+1768**
Income			
Student paying fees to sit for the English Entrance Examination (all 700 candidates)	NA	+3500	NA
Students completing an application form and paying BD 5/-per candidate	+3500	+2250 (Since only 450 will pass EEE and allowed to complete an application form)	NA
Total Income	**+3500**	**+5750**	**2250**

Recommendation

The team decided to implement this project for the coming admission process for the year 2001/2002, whereby it is expected to cut down on the cost and the man-hours needed for this task. Once tried, this process could always be amended according to the needs.

Amal Akleh
Associate Dean
College of Health Sciences

Appendix (A)
DETAILED PROCEDURES OF THE ADMISSIONS PROCESS

1. High School certificates of all the 700 candidates are pre-screened by 2 senior staff over a 12-day period. Due to the sensitivity of this process, the two Registrars and Student Affairs Office senior faculty are responsible for this step. The average salary of these two senior faculty amounts to about BD600 per month.
2. The admissions process requires 1,000 applications annually that are printed at an outside printing press.
3. All 700 candidates are requested to complete an application form and reporting to the accountant to pay the application fee over a period of 12 days. The accountant salary is computed at about BD450/- month.
4. Entering data of 700 applications into the SIMS system.
5. Two secretaries/clerk typists at the Registrar's and student Affairs office give all candidates an entrance examination appointment. This process takes about 3 days. The average salary per month for each staff is about BD350/-.
6. Candidates report to the Entrance Examination hall to sit for 2 examinations: - the English Entrance Examination for 2 hours and a Science Entrance Examination for 1 hour. The hall accommodates 160 in the morning examination session. Another 160 students are accommodated in the afternoon session. The other 320-350 students are tested on the following day. About 30 faculty and staff from all the departments and divisions of the College cooperate with the Registrar's Office in proctoring these examinations. At any one time during any of the exams in each of the morning and afternoon examination sessions during the 2 days, a total of 4 academic faculty and 2 staff proctor the students in the hall. As mentioned above, the average salary per month for each faculty is about BD600 and for each staff about BD350/-.
7. A team of 6 English faculty correct English examination papers over a period of 2 days.
8. A team of 4 faculty and 2 staff from the Registrar's Office correct Science examination papers over a 2 day period.
9. English and science grades are entered into the SIMS system by 2 faculty and 2 staff at the registrar office over a day period.
10. Admission Committee screens passing from failing candidates over a four hour meeting with Chair of the Nursing and Allied Health Divisions at the College. The average salary rate of each of the members on this committee is about BD1000/.
11. The Registrar's and Student Affairs Office post results. Students who pass both the English and Science Entrance Examinations are given an interview appointment. This process is completed over a 2-day period by 2 full time staff at the Registrar's office. About 400-450 candidates pass the Entrance Examinations and are eligible for a personal interview.
12. Each of the successful candidates goes through a 15-minute interview by an interviewing committee consisting of 2 faculty and staff members. One member is from the service side and the other from the College. Each interviewee is evaluated for 5 minutes before the other interviewee is interviewed. Hence, each day about 3 candidates are interviewed by one committee per hour, or 48 candidates in both days. In order to finish the 450 candidates. The number of committees needed is ten.
13. Final Admission Committee (consisting of the Dean, Associate Dean, three chairpersons and the head of registration) meet for about 4 hours to select the final accepted candidate. The average salary rate of the members on this committee is about BD1000.
14. Preparation and announcement of the results in the local newspapers. Two staff and the 2 senior faculty at the Registrar's Office complete this process in about half a day.
15. Successful candidates read their names in newspapers and report to the Registrar's Office to complete the medical and CID forms. The 2 staff at the Registrar Office complete this process over a period of 5 days.

Improve the Quality of Secretarial Services in the Nursing Division at the College of Health Sciences

Introduction

Secretarial services are a vital service in any organization and play a major role in making the organization's activities run smoothly and in a timely manner. At the Nursing Division in the College of Health Sciences there are three secretaries with a wide range of secretarial duties. They serve 36 faculty members, 5 heads of programs and the Chairperson of the Division. Their duties range from typing letters and exams, preparing modules to answering telephone calls, doing filling.

Problem Statement

The main problem was that the quality of work produced by the secretaries had become increasingly poor, despite their qualifications and training. Heads of Programs complained that their work was not completed on time, that the typed work is full of spelling and grammatical mistakes and has to be corrected 3 - 6 times, causing delays. More than once, examinations papers have to be revised and corrected manually because of lack of time to type further corrections. There were also complaints that telephone messages are not conveyed to staff, and secretaries spend a lot of time on their own personal calls, etc.

Root Cause Analysis

In order to investigate the reasons for the reduced quality of work among the Nursing Division secretaries, a team based on Belbin's theory was established. Following meetings and brainstorming on the reasons attributed to the low quality of secretarial services, the following problems were identified:

- Lack of space: three secretaries are sharing one office, which contains photocopy machine, small library, faculty mail boxes and six filling cabinets, etc. The office is always overcrowded by members of faculty bringing in their typing and photocopying assignments, collecting their mail, reading the notice-board, collecting classroom and AV room keys, collecting water for their tea, etc.
- Faculty hand in their work at the end of the working day and expect their assignments to be ready first thing the next morning.
- Faculty hand in scribbled and illegible work, often written with light pencils and unclear.
- Sometimes, faculty sit beside secretaries, editing their work while it is being typed. This is time consuming and reduces the secretaries' concentration.
- Secretaries find it difficult to refuse personal work from faculty.
- Secretaries have to clear up the untidy mess faculty leave behind after completing their photocopying.
- Engaging the secretary computers by some faculty because of lack of computer terminals in the Nursing Division.
- Unequal and disorganized distribution of workload among secretaries.

Alternative Solutions

1) Shifting secretaries to three separate offices, which will provide them with more working space, reduce the crowding in their offices and enhance concentration on their work.
2) Allocate/divide responsibilities among them for greater accountability.
3) Upgrade secretaries' skills and knowledge through continuing education courses.
4) Upgrade/improve secretaries' communication/telephone skills.
5) Remove coffee pot from secretaries' offices to College coffee room.
6) Design a work order form to be filled in by the faculty with details of the work, time of submitting the work and when it is due in order for Secretaries to schedule their assignments. This will prioritize their assignments, act as a record of their workload and help regulate the number of assignments they can accept.
7) Faculty to be informed to submit their typing request one week ahead of time, and those secretaries will accept no scribbled work.
8) Division faculty members should be assigned the responsibility of organizing faculty notice board and maintenance of the division library.

Implementation

Because the alternative solutions were linked to each other, it was difficult to work on one solution was decided to work on all the solutions, but emphasize on the first one, which is to shift the secretaries into three different offices. The secretaries were informed of the whole process of change and their approval was sought. A plan with specific time frame was put in place for implementation of change.

We need another three months to finalize the changes, allow time for faculty and secretaries to get used to the new set-up before we could evaluating the level of improvement and staff-satisfaction.

Recommendation

1) A system of performance appraisal should be in place.
2) Continuously meet with secretaries, and provide them with feed back about their work.
3) Request CHS Administration to rotate secretaries among different departments to enable them to learn from each other and from department heads and staff.

Amina Abdulla
Ag. Director of Training
Ministry of Health

The Increased Number Of Non-Compliance In Organization and Manpower Directorate

Problem Statement

ISO 9001 (design through servicing), ISO 9002 (production and installation) and ISO 9003 (final inspection and test) are the three international standards that specify quality system requirements for use where a contract between two parties requires the demonstration of a supplier's capability. When an organization's quality system has been assessed against ISO 9001, ISO 9002 or ISO 9003 by an accredited independent certification body, then the quality system is registered, and can be used as evidence of quality assurance in tendering for contracts. These Quality systems are subject to regular third party assessment based on documented and objective evidence of compliance. According to ISO, the worldwide total of ISO 9000 certificates on Dec. 31 2000 was 408,631. One hundred fifty eight countries are permitted registrations for ISO 9000 and one of these countries is Bahrain.
The Civil Service Bureau (CSB) is the first Government Organization, which was awarded the ISO 9002 certification. In order to maintain the ISO certificate, CSB had set a 99% mandatory compliance level that should be attained by its directorates.

The Organization and Manpower Directorate (OM) compliance level dropped behind other directorates for certain reasons that will be investigated in this study. The situation is due to the increased number of Non-Conformance Reports (NCRs). Proper action is required to solve the problem; otherwise CSB will be vulnerable to lose its certificate, since it is affected by the overall performance of all directorates.
The goal of this study was to provide a list of solutions to help OM reduce its NCRs and increase its compliance level, which needs a long time to observe changes. The result of this study should increase the productivity and enhance the performance of OM.

Organization and Manpower Directorate mission statement is to support and control all Ministries in their economic, efficient and effective utilization of direct and contractual manpower resources to insure continuous improvement in the achievement of their programs and objectives.

Root Cause Analysis

We used brainstorming technique; and after several meetings, we found 8 major causes of NCRs, which are listed in the table below with the percentage of their appearance.

Cause of NCRs	% of appearance
Service does not exist in directorate list of services	25.60
High volume of work load handled by one analyst	24.00
Lack of communication between CSB and MOFNE*	15.50
Ministry delayed in submitting required data	6.20
Computer problems (hard disk, Network and System)	6.20
Delay in top management signature	5.40
Long discussion with Ministry, no final agreement	4.65
Mistakes by Data Entry technicians	4.65

*MOFNE: Ministry of Finance & National Economy
The delay in top management signature does not exist, since a new full time top, management was appointed.

Alternative Solutions and Implementation

1. Advise the Quality team in our directorate to include the services which are not listed in our list of services.
2. The superiors should improve their scheduling and planning skills especially in the initial assessment phase of the studies.
3. CSB and MOFNE representatives should improve their coordination.
4. Inform the concerned Ministry to submit the data on time; otherwise we will close the subject, and they will have to send a new request later.
5. Management Information System Directorate should consider upgrading the computer system used in order to improve the services delivered to its customers.
6. OM employees to limit the number of meetings with Ministry officials and to close the subject until officials organize themselves and contact CSB with a new request.
7. Introduce a fully electronic cover sheet that will be used by the responsible employee to enter data, like other directorates in CSB

   Although we faced problem of resistance to change and the inflexible bureaucratic environment of the government, we managed to implement most of our proposed solutions.

Results

After implementing the solutions, the number of NCRs went down; and the compliance level of OM Directorate increased to meet its vision of having 99% compliance level. The compliance level of OM became 99.4% during the month of October, and it was 99.5% for the month of November 2001. The ranking of OM among other directorates in CSB is advanced by two ranks, which shows the progress. The average compliance level was 98.1%, which is unaccepted; and now it is 99.5%, which exceeds the required level.

The delay in submitting data by the Ministry almost disappeared, and employees are satisfied with the new procedure. However, the problem of high workload is still unsolved, but the directorate is trying hard to solve the problem. The computer system problem still exists, since the concerned directorate is busy with the launching of a big project for the whole government. Electronic systems have been applied, and data entry mistakes are now solved.

Finally, we were happy to have these results, since we did not expect them due to the restraining forces.

Recommendation for Continued Improvement

In order to maintain the compliance level of Organization and Manpower Directorate and even improve it to reach 100% compliance, there should be continued follow-up of the services, good planning and awareness sessions for the employee. Improvement of the new electronic QIDS system should be considered to save time and effort. Encourage management to change its bureaucratic style and improve communication between the concerned persons, since the unfreeze and refreeze were very slow.

We are willing to give all the support to our Directorate and hopeful to win the first rank among other directorates.

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Control of Overtime Over-Spending in Medical Equipment Services

Problem Statement

The Ministry of Health is always under pressure to meet the demands for better quality care and advanced technologically supported health services. In seeking to meet people's expectations to provide cost-effective and quality service, the Ministry of Health continuously evaluates distribution of its resources within tight budgetary chapters, across its various activities. The Medical Equipment Directorate (MED) with its technical services and high cost related activities is among these budget chapters.

Among the budgetary constraints that the Directorate has to cope with is the overtime budget in carrying out essential services, since it has become mandatory for all sections of the Ministry of Health to curtail overtime usage.

The nature, volume and complexity of work which MED is entrusted with is to ensure that essential equipment is functioning and available for immediate use at all times. In spite of prior planning and scheduling of preventive maintenance, periodical corrective adjustments and calibration, equipment breakdown and malfunction can occur unexpectedly at any time, resulting in disruption of patient care services that necessitates immediate corrective action outside normal working hours, on weekends and public holidays on overtime basis.

Other major influencing factors are:

1) Escalating workload as a result of procurement of new medical equipment and scientific hospital clinical devices, besides depreciation of older equipment.
2) Manpower shortage despite approved positions on the organization chart of MED. Almost 22% of approved positions have not been filled due to lack of budget.
3) Civil Service Bureau regulations limit overtime quota to just 5% of the actual approved manpower for any directorate.
4) Exceptionally long delays in recruiting skilled and specialized personnel from abroad.
5) Other Ministry of Health equipment related activities, such as tendering, offers evaluation, delivery, installation and commissioning of equipment, as well as training of users, impose pressure of completion and achieving deadlines beyond the control of MED.
6) Staff absences due to illness and other leaves, as well as the relatively limited 36 hours per five-day working week.

By virtue of their training, discipline, professionalism, appreciation of purpose and dedication, most MED technical personnel have shown exceptional willingness to work beyond official working hours. MED administration found itself relying more on the willingness of its personnel to achieve overall objectives.

Root Cause Analysis

To ensure that the problem is adequately and properly investigated, selected team members reviewed and analyzed the approved functional statement of the Directorate. The team was instructed to use Pareto Analysis to "separate the vital few from the trivial many", and analyzed random reports and work requisitions of 500 jobs (out of 2,000 jobs) carried out during the last six months as well as visiting

MED customers (equipment users) in patient care areas.
The team listed some of the root causes of the problem as follows:

1) Increasing workload generated by additional new equipment and depreciation of those in use.
2) Manpower status remained unchanged with the exception of recruiting 7 new trainee technicians, who themselves needed constant guidance and supervision and constituted a temporary burden on trained staff.
3) Since 1996, the SMC Development project had generated a huge, additional workload during the commissioning and operating phases. By the year 2000, warrantees on all initial equipment had expired. The new ten low-grade technicians positions that were approved for this project did not match the newly generated workload, both in quantity and complexity.
4) MED professional and technical personnel took on additional tasks that normally fall within responsibilities of other directorates and hospital departments.
5) Due to a shortage of skilled manpower, MED departments depended on overtime to carry out essential work outside normal working hours.

Implementation

With its objectives of cost containment and overall improvement of its services, the CQI team, which now included the heads of four main departments at MED, set out to work on the following options:

1) Advance planning and work scheduling and re-scheduling.
2) MED responsible personnel would evaluate the quantity, time and quality of efforts expected in extending non-essential deadlines and irrelevant tasks.
3) Rescheduling hours of work and resorting to a six-day week.
4) Redistribution of personnel resources and giving employees time-off, to compensate for overtime work.

Results

The team monitored and analyzed progress and implementation on a daily, weekly and monthly basis. Department heads maintained a tight control, scrutinizing all assignments, job requisitions and routine, essential duties and responsibilities in accordance with stipulated functional statements and work demands. Team members visited MOH user locations to monitor the reaction of customers as well as the recorded number of working hours, including those outside normal hours of work.

At the end of the trial period, it was found that the dependence on overtime was remarkably reduced by almost 50%. Output increased with staff morale and a general sense of satisfaction and appreciation of their achievements. Meanwhile, at the end of the trial period, the Directorate of Personnel and CSB approved MED's request to transfer the 10 bio-medical equipment technicians to the extended hours working schedule (42 hour-week instead of 36-hour week). This development was expected to result in a substantial overtime saving of 2,570 hours per year.

However, the trial period was considered too limited to make a proper appraisal of staff and user satisfaction. The working pattern requires further modification and adjustments to be sustainable on a long-term basis.

Recommendations for Continued Improvement

To achieve overall improvement of MED services, it is necessary to gain and consolidate support and commitment of staff by involving them in decision-making.

Participation of users, officials from the Directorates of Personnel, Finance and Materials Management in common decision-making issues affecting staff performance, budget and procurement is also vital.

MED makes the following commitments towards achieving customer/staff satisfaction and improvement:

1. Use Pareto analysis in order to focus on key factors, prioritize the most important and relevant factors.
2. Always use Quality Control tools and methods to ensure that all possible attempts have been explored.
3. Attempt to get the best out of an assigned group or team in identifying problems, exploring valid alternative solutions, decision-making and collective action.
4. Use errors and individual (poor/hasty) decisions or reactions to get constructive feedback in order to improve the working process, motivating people to recognize quality or team work.
5. Encourage progress, development of planned change as a tool for improved quality, customer satisfaction and staff motivation. Involve the right participants during the change process.
6. Develop well-thought out control and monitoring systems and protocols to ensure effective implementation and verification in detecting errors early enough to take corrective and preventive action.
7. Listen to suggestions. Be a good communicator of ideas, vision, goals and overall objectives. Always work from a number of options formulated by a group of relevant people. Ensure that goals are challenging, realistic and clear.
8. Become inspirational and motivational by delegating responsibilities, giving associated authority and empowerment. Trust your staff and let them know that you do so by true action rather than sermon.
9. Give continuous support and encouragement to all team members while over seeing or monitoring the various stages of assignments or projects.
10. Invest in working colleagues' ideas and suggestions to motivate them and provide continuous quality improvement for the stakeholders - the customers.

Ebrahim Y. Yacoob
Director, Medical Equipment
Ministry of Health

Student-Faculty Classroom Teaching Evaluation in the Department of Nursing at the College of Health Sciences

Introduction

The College of Health Sciences (CHS) is the only provider of high quality, efficient and comprehensive health care education and training for nurses and allied health professionals in Bahrain. The College was established in 1976 and has developed new facilities and new programs since then, continually responding to the change in demand from the health care industry. The College educates and trains young people to take up professional careers in the health services in a wide range of roles including nursing and allied health professionals. In February 2000, the CHS committed itself to develop a new strategic plan and to have a new vision, mission and strategic directions for the future. This vision contributes towards greater educational achievements and social developments.

Some departments at the CHS are still lacking a student-faculty classroom evaluation form which are supposed to be done at the end of each course. There are no regular reports on faculty progress in teaching at the end of each course.

Project Objective

The stated goal of the project was to enhance the quality of student performance and satisfaction at the Nursing Division in CHS. In asking ourselves what is the student rating of teaching effectiveness, it is probably worth highlighting the more persistent questions:

- Should there be a more uniform method of evaluation system across CHS?
- How frequently should teachers' evaluation be required?
- Who should be allowed to summarize, interpret, and use the result of teaching evaluation?

Quality Improvement at CHS

In order to achieve successful quality improvements at the CHS, we must first make changes in our philosophy, our operating mechanisms and our human resources program. In addition, customers' (students') involvement, technology, materials and methods of teaching are critical ingredients in TQM towards successful quality improvement at CHS. A new standard form is the student evaluating the teacher's classroom performance without hurting their (faculty) feelings.

Problem Statement

- The CHS takes great pride in its faculty, considering them as the most important assets of the College. They hold high academic qualifications from the most reputed universities. Students at CHS possess high academic standards both on entry to the College and later on. They are eager to learn, self-motivated and self-directed. Students are our first customers; their educational welfare is in the forefront of all CHS activities. They are expected to be outstanding or good in their performance once they are in the clinical areas or upon graduating from CHS. Yet the most critical problem is that the majority of nursing departments (especially post-basic and BSN programs) have no standard or evaluation form that is done by students to show the effectiveness of their teachers in classroom teaching.

CHS Customers Affected by the Above Problem

Internal customers: Post-basic students, BSN students, CHS Administrator, Head of the post-basic and BSN programs, Chairperson of Nursing Division, Faculty

External customers: In-service staff, patients at hospitals, patients in health centers, Ministry of Health

What could be done to improve the quality of this situation

My mission was to expand markets and diversify products to meet the needs of students and organization (CHS). I want to see CHS becoming a learning organization that focuses on knowledge management, customer development, staff learning and development.

One way to achieve the above goal is by establishing a standard evaluation form for students (our customers) to evaluate faculty performance in classroom teaching.

If we continue with the new standard by providing the best possible training at the lowest price without sacrificing the quality in any way, we will have the best product or students in the GCC States.

Smart Goal

To increase effectiveness of the program and to improve customer (student) satisfaction with quality of evaluating teachers' classroom teaching performance from the present 30% to 90% by January 2002 without affecting faculty feelings.

The Team

As coordinator, I followed Belbin's Team Roles in selecting members of the team based on their strengths, skills and experience at CHS. When I addressed the problem to them, they were willing to participate in the project and believed that this change would be for the better, both for them as well as for the students. The team set out to identify the causes of the problem through brain storming sessions. Some members had reservations on the suggested use of a questionnaire to get students' feedback on teachers' classroom teaching:

- Lack of trust in students' answers as some students' dislike of their teachers may result in not being fair and honest in their rating.
- More than one faculty teaches the course; this might lead to bias in the rating of specific faculty.
- Faculty overloaded with teaching, and lack of time.

However, the Team members carried out extensive research/review on student-faculty evaluations and reached the performing stage where all agreed on the design of a questionnaire which was used in the pilot test among students to get their feedback.

Root Cause Analysis

During its investigation, using the Fishbone analysis and Pareto chart (also known as the 80 - 20 rule) the team identified the following causes for the problem:

Heads of Post-basic and BSN programs

- Lack of on-going improvement in the programs
- Lack of managerial knowledge, old management style, inadequate support
- Lack of awareness about faculty classroom input

Faculty

- Lack of supervision by their superiors
- Lack of interest and motivation
- Lack of confidence, fear of being evaluated by students

- Resistance to change, not updated, lack of preparation
- Limited practice

CHS Administrator

- Unaware of students' needs, no clear picture and system to identify students' concerns
- Unaware about teaching methods in the division
- Lack of meetings with students

Nursing Division Administrator

- Lack of information on student performance
- Too confident about faculty performance
- Too busy with administrative work
- Many other responsibilities

Students

- Increasing student demands
- No student-faculty evaluation on a regular basis
- Weak students, increase in rate of failure, increased turnover, weak clinical practice
- In-service dissatisfaction, lack of interest

Alternative Solutions

The team recommended the following solutions:

1. Evaluate and modify the current student faculty classroom evaluation form implemented in the AD Nursing Program for use in the post-basic/BSN programs.
2. Make a new form of student faculty classroom evaluation for each course teacher, and to be evaluated on a regular basis at the end of each course.
3. Get an external evaluator (from other institutes) to make a classroom presentation once every 3 months and evaluate teaching methods and the standard of student classroom participation.
4. Let a member of the faculty who is a PhD holder evaluate the teacher/classroom teaching performance by visiting the class once every 2 months.
5. Make a peer evaluation during classroom teaching.
6. To raise the standard of accepting students in the BSN and post-basic programs at the CHS (GPA must be 2.5 instead of 1.7) and not to accept direct entry students.

The team agreed on solution No. 2 and recommended that the evaluation form be distributed to students by the concerned faculty, rather than by the Chairperson of the Division or the Department Head, to give them the opportunity to see their weak points and work on strengthening them.

Pilot Test

A pilot test using the new standard form of student-faculty classroom evaluation was carried out on 20 of the post-basic and BSN students. No modifications were needed and 100% of the students were satisfied with the new change to evaluate the faculty classroom teaching performance and 18 (90%) stated that teachers were very clear in their teaching methods.

Implementation

Lewin's (1947) model of change was used to effectively change the faculty feelings on being evaluated by their students and reaching customer satisfaction by taking the following steps:

1) Unfreezing:

i) All team members were told about the importance and necessity for this change.
ii) The data of both pilot tests from the students' assessment survey were presented to the team. No resistance was noticed up to this point because the process of evaluation was different. Faculty would now be responsible for circulating the evaluation form themselves and would be able to see their weaknesses and strengths from analyzing the students' comments rather than being informed by the department head.
iii) The team felt that such a solution would satisfy students and increase their motivation.
iv) The team was involved in setting the evaluation criteria, ensuring their commitment to the change.

2) Implementation:

57 students from post-basic/BSN programs were given an evaluation form that focused on:

i) Classroom teaching methods
ii) Teacher behavior with students in the classroom
iii) Teacher fairness with set-up and correction of post tests and exams

There were two open-ended questions regarding teacher strengths and weaknesses and any other suggestions that students wanted to recommend. Students were informed of the purpose of the evaluation and were asked to be honest in completing the form. They were surprised with such improvement and change, while Department heads and chairpersons expressed their interest and satisfaction with the new changes.

3) Refreezing:

To reinforce the change, we have to refreeze the change, and this was done by sending letters to each team member, thanking them for their excellent progress, and seeking their continued support to improve the program. After completion of the evaluation by the students, faculty suggested implementing the same form as a standard (uniform) to all CHS departments. In order to stabilize the change, a meeting was held with the Dean, who expressed her interest and recommended meeting with other chairpersons within CHS to explain the purpose of the change; but due to lack of time and involvement in preparing for the Silver Jubilee celebrations of CHS, this meeting was postponed until February 2002.

Results

The overall results of the questionnaire given to 37 students from the post-basic and BSN students at the end of the course to evaluate their teacher's classroom teaching methodology revealed an increase in student satisfaction rate towards the new solutions at CHS Nursing Division.

Recommendation for Continued Improvement

Student-faculty evaluation appears to be a dependable instrument that probably produces consistent student ratings of individual teacher quality when adequate observations are taken. In this project we considered students' satisfaction as the desired outcome. Student ratings are not the only possible source of information about teaching effectiveness, and they might not be the best source of that information.

However, they are the most widely used and visible means of teaching evaluation. As coordinator for this project, I recommend that:

- Look into all departments of CHS and apply a uniform evaluation form.
- Examine other aspects of student satisfaction, e.g., student-teacher relationship.
- Recruit a consultant who would be the resource person for updating the change.
- Establish a built-in-evaluation system to continuously monitor the change.
- Seek an expert (experienced in the area of evaluation) to assess our curriculum in general.

Dr. Fakria S. Diari
Senior Lecturer, Midwifery Program
College of Health Sciences

Improve the Nursing Continuing Education Standards

Introduction

One of the most effective ways of investing in human resources is to develop and train people in order to improve their performance in their job, as they are the key assets in any organization. Nurses in the Ministry of Health of the State of Bahrain comprise the largest percentage of health care employees and are considered the most valuable resources in terms of providing quality nursing care to the clients. The need for continuous education is required due to rapid change in technology; increased pressure on the nurses' role in the health care delivery system, etc. According to Mac Byde and Bititic (1996) quality includes increased competition, customer satisfaction and improved utilization of resources. Achievement of customers' satisfaction is a priority goal of the Directorate of Training. Quality requires aligning all resources (people, departments and services) of the organization to the best possible services to its customers.

Problem Statement

It was observed that a set of standards were needed to measure productivity of nursing faculties and ensure the nursing personnel in the Ministry of Health are providing effective and efficient nursing service to their client. Therefore, standards of training and education hours were developed with the help of nursing continuing education faculties.

The first step in any control process according to Griffin (1996) is to Establish Standard, Measure performance, Compare performance against standard and Determine need for corrective actions. I started by evaluating the activities carried out by the staff of nursing continuing education for a period of three months and included such things as in classroom teaching, clinical teaching, etc. The outcome revealed that there was no compliance to the standard for training hours, which was developed by Directorate of Training for nursing faculties. for example the number of hours spent on nursing continuing education section were lower than the standard hours required.

The aim of this project is to meet our customers' satisfaction.

Root Cause Analysis

Cause and effect (fishbone) and brainstorming were used to identify the causes for non-process compliance to the standard hours. The team identified the root cause analysis as follows:

1. Unrealistic standard of training hours
2. Scheduling courses
3. Committees
4. General courses involvement in other courses
5. Staff development sadden staff
6. Nursing services administration not releasing staff
7. Cancellation of some courses
8. Miscellaneous work

Alternative Solution

After reviewing all causes, it appeared to the head of Training and Development that the planning was inappropriate. Based on this assumption, all coordinators were requested to develop a new plan for the year 2001, taking into consideration the standard hours for training. Faculty submitted the requested plan.
In spite of effective re-planning of the programs, the performance is still below the existing standard. The group felt that they could focus their effort and time on the issue that they can improve according to Covey (1984) work to increase their circle of influence. After careful review of the root causes analysis, it was decided to change the standard because they viewed it as unrealistic. The new set of standards was then developed and approved by all team members. The team chose this alternative because of the following reasons:

1. Highly practical, more realistic and flexible
2. Consider staff development
3. Other training activities like classroom activities are more visible
4. Team involvement in setting the standard will lead to more job satisfaction and commitment to the standard and ensure the responsibility

Implementation and Evaluation of New Standard

The following process will be done in order to achieve the quality and compliance to the new standard

- Do performance management with all nursing continuing education and set goal for improvement (done already).
- Plan training programs for at least one year, considering number of hours in the new standard.
- Head of Nursing Continuing Education should monitor activities and achievement goals every three months.
- Staff satisfaction with new standard as evidence by goal achievement.

Recommendation

The team recommended:

- Standards should be developed for entire staff of Training and Development, not only for the nursing staff.
- Increase staff productivity and avoid cancellation of courses.
- Increase support system to reduce workload on faculty.
- Develop a system to measure quality of courses delivered by Training and Development staff to their customers.

Ms. Hakeema Ghuloom
Head, Nursing Continuing Education
Directorate of Training
Ministry of Health

Inefficient CSB Manuals

Problem Statement

The Civil Service Bureau (CSB) sets rules and regulations to organize the work in all the Ministries. CSB also provides services to the Ministries and issues and distributes manuals to all Administration and Finance Directorates in the Ministries, explaining these services and guides them on the requirements for each service. Most of the managers in these Directorates keep the manuals in their offices, so 70% of the staff cannot use them. Some of these manuals need to be updated frequently, and obsolete manuals have to be discarded.

Our aim is to increase the effectiveness of these manuals by making them accessible to at least 80% of employees who need these manuals, and to update these manuals with ease and less cost.

Root Cause Analysis

The team was selected according to Belbin's Team Roles and used brainstorming technique to identify and define the problem. There are 3 manuals that are issued by CSB:

1. Nature of Action Manual
2. General Services Manual
3. CSB Rules and Regulations

Each Directorate should have three manuals, so we identified which directorates should have which manual. The total number of Directorates is 23 with a total number of 140 staff in all Directorates. After further meetings, the team found that only the Manager and Chief of each Directorate could access these manuals, a total of 46 (33%) employees from the 23 Directorates, while 94 (67%) of the employees do not have access to these manuals. We decided to look for ways to utilize new technology in issuing these manuals and make them accessible to all concerned.

Alternative Solution

Based on the fishbone diagram on the causes of the problem, the team decided to leave the long term solutions/causes for further continuous development study and use fast and short term solutions for the problem as follows:

- Print more copies, but this solution is costly and difficult to update in the future.
- Since most of the Ministries are connected to the Government Data Network (GDN), it was suggested to manipulate these manuals electronically and store them in central server so that only authorized personnel in all Ministries can access the information. The manuals and information can be published as read-only on the Intranet Homepage in the CSB server with secure access to avoid abuse of the information.
- Send copies of the electronic manuals in compact disc (CD) form to those Directorates who are not connected to the GDN, and update these copies manually whenever necessary.

Implementation

We started unfreezing the situation by identifying the problems and major opportunities for change, with support from the Head of CSB and AUS. The CSB vision about the intranet homepage is to " Publish any information that helps ministries to do better work". Training sessions were provided for the staff in Management Information Systems Directorate on how to publish the information on the homepage, after

which we started building the Intranet Homepage with one existing manual and published it on the Homepage. After launching the Intranet Homepage, for testing in CSB, all computers in CSB were connected to this homepage and the manual was accessed through the page without any problem.

The second step was to finish publishing two more manuals on the homepage and provide access to all Ministries connected with CSB Intranet site. We sent letters to the Ministries connected with CSB Intranet site to inform them about the contents of this site. For those Ministries that were not connected to the GDN, we produced a copy of CSB Intranet Site in Compact Disc (CD).

Refreezing: We continue improving these electronic manuals on the Intranet site by adding the facility of search. Also we added to the design and updated the Intranet site to MIS services and created a working procedure.

Results

The results were very encouraging, showing the percentage of accessibility of these manuals increasing from 33% with hardcopy manuals, to 82% with the new Electronic Manuals on the CSB Intranet site, with 115 (82%) out of 140 staff from different Ministries having computer access. By accessing CSB manuals, the employee will be aware of CSB requirements for services; and they will also have up-to-date information, which will then improve their work.

Recommendations for Continued Improvement

To continue the improvement we need to connect all Directorates with GDN and increase the number of computers in directorates so that more employees can access the Electronic Manuals on the CSB Intranet Site.

More information such as statistics, email and telephone directory, CSB newsletter, job vacancies, etc., can be made available on the CSB Intranet Site. Electronic mail can also improve the communication between the employees in the Government of the Kingdom of Bahrain.

Also, launching CSB Internet site will improve the knowledge of employees in regard to the changes, rules and any other important information, and enable them to access the site outside the work place. Job applications can also be done through the Internet site.

Mr. Hasan Algalaf
Civil Service Bureau

Physical Disposal Of Fixed Assets

Introduction

Directorate of Finance (DF) is responsible for providing comprehensive financial management services to all departments of the Ministry of Health (MOH) and manages the financial resources of MOH in accordance with the goals of MOH and in compliance to the laws of the Government of Bahrain, Standard Finance Manual (SFM) and generally accepted accounting and financial management principles and to enhance Value for Money to the Government in achieving those goals. The directorate reviews its procedures from time-to-time to see if any improvements can be made in fine-tuning the processes to achieve efficiency. One of the functions of DF is to exercise control over fixed assets of MOH, such as dealing with Purchase Requests, Requests for Disposal of Fixed Assets, Purchase and Payment for the Assets, maintaining a Fixed Assets Register and conducting physical verification of Fixed Assets to ensure their safe custody.

The Directorate of Finance opted to apply CQI to improve performance, quality and increase productivity and customer satisfaction in the area related to Fixed Assets management.

Problem Statement

The fixed assets, which are approved for Disposal by the Fixed Assets Disposal Committee, lie around for a long time at the Ministry premises in various locations including Head Quarters, SMC and Health Centers before the Central Stores Directorate (CSD) collects these. These assets look untidy in the working area, unsafe and attract pilferage and misuse if left for a long time. The Ministry of Finance and National Economy Standard Finance Manual classified fixed assets into two categories as follows:

- **New / Addition Assets:** Assets required for a new Program or new employee.
- **Replacement Assets:** Assets required to replace existing assets. This process goes through several stages whereby the item is first checked to see if it can be repaired - if it cannot be repaired, then approval for disposal has to be sought from the appropriate directorates until it reaches CSD who takes time to come and collect the asset.

Root Cause Analysis

A team of eight members was formed, using Belbin's team roles as a guide, from different directorates/departments of MOH and summarized the root causes of the problem as follows:

1. New assets are ordered but not received yet because of long procedure or due to lack of budget, so the user departments keeps and uses the old asset until its replacement arrives.
2. Medical equipment is never returned to CSD as the Medical Equipment Directorate (MED) retain the old equipment for spare parts.
3. Budget approval for the new item takes too much time.
4. CSD lacks resources to handle a big volume of work, especially since it deals with all Ministries and Government entities of the Kingdom of Bahrain.
5. Lack of coordination between CSD and MOH, especially in regard to appointments for collection of old assets.
6. The user departments, especially SMC are not keeping old assets in one location, and it is very difficult for CSD to interrupt patient-related services.
7. The Headquarter buildings do not have storage locations where the old assets can be kept until CSD takes the delivery.

The team did a survey of 100 concerned persons including DF Staff, Users and CSD employees. Based on the survey with regard to disposal of fixed assets, it was found out that in SMC 80% have problems in the disposal of assets, whereas only 20% are satisfied. In PHC 70% have problems and only 30% are satisfied and in HQ 60% have problem and 40% are satisfied.

Alternative Solutions

Through several processes including brainstorming, it was always kept in mind that changing the Government (MOFNE) Financial rules may have merit in some cases but will be difficult and time consuming to achieve. The following alternatives, which can be implemented within the existing guidelines and framework were considered and studied further:

1. MOH have to arrange transportation of the assets to CSD.
2. DF to appoint 3 Fixed Assets Disposal coordinators to co-ordinate with user departments and CSD throughout the process of disposal of an asset.
3. User departments have to co-ordinate with Assets Disposal coordinator at DF as soon as they are ready to dispose the old asset.
4. The disposal of old assets will be linked to availability of budget for the new asset.
5. Users like SMC and HCD have to designate central storage locations from where old assets should be collected.
6. CSD and DF have to agree on the schedule of collection of old assets by CSD.

Implementation

The following actions were taken during the implementation. New procedures with User Departments was agreed upon and disposal of equipment is only approved after ensuring that budget is available to buy the replacement. The disposal and purchase requests were to be approved simultaneously and process to buy commenced at the same time. The user departments advised DF when the old equipment was ready for collection. DF appointed 3 Fixed Assets Disposal Co-coordinators one each for: SMC, Health Centers and HQ and Periphery Hospitals. We designated nine locations (i.e. SMC main block, SMC Al-Fatah Building, Naim HC, HC Admin, Isa Town HC, Sitra HC, Muharraq HC, HQ near Tylos Building and Psychiatric Hospital) where the old assets were stored and in turn collected by CSD. DF agreed schedule with CSD, showing days and times at which these locations were visited. The user departments gave their requests to DF at least 48 hours before the designated time/day, as CSD only dealt through DF co-coordinators. DF maintained a register showing all the forms approved for disposal of assets and tracked assets, which are not collected by CSD. They also issued periodical letters to users reminding them and giving details of assets, which had not been offered for collection.

Result

The team monitored the progress of implementation on a weekly basis, and monthly review meetings were held. Effective communication and fine tuning the processes overcame the initial teething problems.

As done at the time of analyzing the problem and its causes, the team again did a survey of 100 users. The results were remarkable.

Customer Satisfaction

AREA	Percentage before Implementation			Percentage after Implementation		
	SMC	PHC	HQ	SMC	PHC	HQ
Lack of Coordination between CSD & MOH	52%	35%	45%	7%	9%	3%
User related problems	33%	46%	39%	10%	11%	12%
Satisfactory	15%	19%	16%	83%	80%	85%

Number of satisfied customers has gone up to 83% from 20% in the case of SMC, 80% from 30% in PHC and 85% from 40% in HQ. The frequency of meetings were reduced but the team has been mandated to further improve the satisfaction index and explore new ways to achieve progress.

Recommendations for Continued Improvement

The following recommendations are made for continued improvement:

- Structure the agreed process and formalize to ensure that people do not go back to old procedure.
- Develop forms for distribution to users and procedure manual for any new staff or supervisors.
- Work with HID to improve the system and automate the system on net worked computers to avoid paper work as part of Ministry of Health Information Systems (MHIS).
- Initiate discussion with MOFNE to bring about long-term changes in the process to make it more efficient.
- Explore if MOH can be allowed to physically dispose of the old assets with out going to CSD.

Mr. Hassan Ali Jaber Al Nasser
Acting Director of Finance
Ministry of Health

Services Improvement for Customers

Introduction

Maintenance and Engineering Services Department within the Ministry of Electricity and Water is looking after all the maintenance activities of the entire water network in the whole of Bahrain. The major function of the department includes the following:

- Maintaining proper water supply to all customers
- Detecting and fixing water leaks problems
- Fixing and repairing domestic water meters for all customers
- Conducting damage prevention program for the whole network
- All the above activities are essential and of extreme importance to maintain the integrity of network and at the same time secure adequate water supply for all the customers.

Problem Statement

"Currently, it takes an average of 18 days to respond to meter defect repair while the desired standard is 3 days or less"

The performance of dealing with all of the above major activities is very satisfactory as the service can be accomplished within a maximum of 1-2 days after receiving the repair requests, except for fixing and repairing of domestic water meters, which sometimes require about 18 days to attend to depending on the nature of the problem.

The installation of domestic water meters commenced in 1984 and was completed in 1994. The Government's decision to introduce domestic meter billing was to discourage wastage, encourage conservation, make the customer aware of effective utilization of water, and consequently, reduce the burden on the national economy of the country.

Installation of domestic meters is a continuous process as new buildings and houses are constructed every day. The total number of installed water meters to date (May 2001) is approximately 12,000 meters (i.e. 127,000 customers). This means that the metering section should be able to deal with any repair and maintenance requirement of all the installed meters in a very quick and swift response due to the urgent nature of most of the cases (i.e. meter blockage and no water supply to the customer). The average number of meter defects reported to the metering section is approximately 1,000 per month while the accumulated outstanding defects are more than 3,000 defects, leading to a delay of approximately 14 days (urgent cases are being attended to within one day by the emergency maintenance group).

Objective

The objective is to reduce the attending period for meter defect to reasonable periods of 1-3 days, and the outstanding meter defects should match in level with the new received defects per month. This will solve the problem of excessive outstanding defects and hence reduce the attending period to a meter defect.

Team members

Team members were selected according to Belbin's Team Role and the actual job functions they perform in the department and according to their different capabilities and qualities, in order to complement each other towards the achievement of the

goal and objectives. Since all team members were from the same department, communication was very effective and clear.

In the initial meetings, the impact of poor services on both customer satisfaction and the enormous loss of water and revenue to the country were discussed. It was very essential at the very beginning to alleviate the sense of responsibility of all members to a macro level rather than limiting it to a very micro level represented on solving meter defects. Discussion was directed towards major obstacles and difficulties that were limiting productivity and work improvements. Due to differences in actual job responsibilities and authorities, members saw the difficulties and causes from their own angle and point of view. Members were given five days each to conduct their investigation and prepare individual lists of causes. These lists were then analyzed and discussed. It was agreed that the following represent the major causes:

Causes	% Contribution
1. Inadequate number of maintenance groups distribution and allocation to handle defects in the field	30%
2. Slow communication and transfer of defects from Customer Services Department to Meter Workshop`	20%
3. Lack of enough vehicles to attend to defects and continuous breakdown.	15%
4. Very old PC Unit (486 MHS\Z) and old software to update and produce defects data (data management)	15%
5. Lack of enough motivation for the staff (more recognition and appreciation is required for field staff)	10%
6. No clear and defined target level of repair achievement to be accomplished by the maintenance groups on daily and/or monthly	10%

Alternative Solutions

After agreeing on the list of all major causes, the team met again to discuss alternative solutions and approaches to improve the quality of service to customers. Each team member had his own approach, and the variation in opinions was very obvious in the alternatives each one presented:

1. Start solving the causes within the area of influence of the team members first and wait for other causes to be solved later on. Solution within the area of influence includes proper allocation of maintenance groups and motivation/recognition of staff.
2. Consider only major causes at the beginning to be solved as this will lead to breakthrough towards solving the problem. Major causes included allocation of enough maintenance groups, communication of defects from customer services department, lack of vehicles and new PC Unit.
3. All the causes should be dealt with at the same time whether within our area of influence of outside to maximize the achievement at all levels and link it to the performance reference.

- Although solution No. 1 is within the influence area of the team members, adopting it will only produce limited performance and quality improvement which may not be stable and continuous as long as other causes are still not being solved. Adopting this solution will result only in shorterm improvement after which a performance decline is expected as a result of reaching a saturation stage due to the imbalance between work load requirements and tools/means available to do the work.
- Alternative No. 2 seemed very attractive, as all the major causes, which

represent 80% of the problem, would be taken care of. However, only one major cause is within the influence circle of team members while other major causes are outside the circle of influence and would lead to almost the same performance result in the short-term as was the case with alternative No. 1 as other causes may take time to be solved.

- It was agreed that alternative No. 3, which takes care of all the causes and deals with it at the same time was seen as the best and optimum approach, which leads to maximum performance achievement. The nature of the situation where customers' satisfaction is demanding should be dealt with by solving all the causes of the problem as one package as much as possible.

Team members agreed to distribute responsibility of dealing with the solutions of the causes as per the authority and responsibility level and as per their role in the team. All necessary data and information was prepared and presented to the top management to justify the urgent move to provide all necessary requirements to solve the causes and give top priority to achieve the required goals for customer satisfaction.

Implementation

The implementation of the improvement program started by unfreezing the existing situation; and as per the responsibility assigned to each team member, the following actions were taken by each team member according to his responsibilities and authorities:

- Two members met with all maintenance groups involved and explained the purpose of the service improvement program and the plans/goals including details of the whole improvement program, facilities and requirements needed to implement the program, and the recognition of achievements by producing monthly performance analytical reports showing improvement.
- Another member met with maintenance groups, seeking to achieve a minimum quantity of meter defects repair per day and month by each maintenance group. After discussion, they concluded that each maintenance group, depending on the nature and location of the defect, could attend to an average of 15-20 defect repairs per day. The whole improvement project should be maintained and closely monitored by the concerned team member to ensure steady performance towards achieving the goal.
- The team member responsible for the allocation and distribution of maintenance groups, set up a plan to schedule the annual leaves for maintenance groups so that only one group can take leave at a time, to avoid overlapping and at the same time ensuring that groups were not being sent for unnecessary training courses during the coming months.
- As Manager of the section and conductor of the group, I was responsible for solving the major causes within the quality improvement program, which were:
    a) Improving defects report communication with Customer Services: A decision was taken to address requirements to improve the communication system with top management. A proposal was made to the Undersecretary to provide an electronic mailing system to enable the sharing of meter defects data. However, due to major modification and budgetary requirements, it will take a long time to implement this proposal. Meanwhile, as an alternative to save time and paper work, it was recommended that maintenance groups go directly to

the Customer Services branches to collect the list of defects reports with all related details for respective areas. A pilot test was conducted by sending one maintenance group to the Isa Town Customer Services for one week and was closely monitored. The resulting achievement was much better than the previous communication system. This was followed up with more maintenance groups being sent to other branches with effective results.

b) Provide enough vehicles: the Ministry resolved this by replacement of all used and damaged vehicles.

c) Provide new PC Units: After top management were presented with data showing that the use of an old PC unit affected delayed attendance for defects, prompted management to provide a new PC Unit (Pentium III 866 mhz). This resulted in reducing the time for data entry and at the same time provided updated information of each defect report, as well as the production of weekly and monthly reports containing accurate data.

Results

The quality improvement program has been very successful as it achieved its planned target. The response period for defect repair has been reduced from an average of 18 days before implementing the program to only one day after the successful implementation. The productivity of the department and employees concerned has effectively increased, as the work has become more organized and continuously being followed up by supervisors and engineers. Furthermore, the implementation of the quality improvement program has resulted in the formation of a teamwork environment and a high standard of cooperation amongst all team members, as well as other involved employees and will enhance better achievements in the future. A very important result of the program was the impact of involved employees' recognition by top management of the department, which contributed to boosting the morale and loyalty of employees to work more effectively.

Recommendation for Continued Improvement

The implementation of the services improvement program for customers has successfully achieved its planned target. However, this should not be considered as the end of the mission of the organization and the concerned team looking after the program. Quality Improvement is a continuous process which should always be put into action and actively exercised to meet all the changes which could affect the performance of the organization to fulfill its obligation towards its customers in the future.

The improvement program could have been even more effective and successful if the electronic communication of data between the Customer Services Department and the metering workshop was available to up-date all information with regard to defects repair and to establish a database for follow-up of pending cases. However, this is being considered for the near future; and the Ministry has already undertaken a huge project to establish electronic communication services within the Ministry and for all its customers that will cover the services that the Ministry provides. The project is considered the corner stone within the Government's national plan to provide a better and efficient service by all its organizations to all its customers.

Mr. Khalid Ebrahim Khalifa Al-Mansour
Manager, Maintenance and Engineering Services
Ministry of Electricity and Water

Preventive Maintenance Improvement at SMC

Introduction

The Directorate of Engineering and Maintenance (DEM) in the Ministry of Health (MOH) provides engineering services to all MOH properties, including hospitals, health centers and various other miscellaneous buildings. Patient care areas are given top priority and the maintenance services provided to them are in two forms, Planned Preventive Maintenance (PPM) and Corrective Maintenance. PPM can produce the most cost-effective and satisfying result to the end user, if implemented correctly.
This CQI assignment will attempt to improve the quality of PPM services.

Problem Statement

The main objective of this project was to increase the efficiency and quality of the service, which will in turn reflect customers' satisfaction level including the patients.

1. Increase customer satisfaction by at least 10%.
2. Increase the efficiency and quality of the service by 10%.
3. Make a formal pilot procedure for similar activities within DEM.

Root Cause Analysis

DEM engineers and SMC administrators, during their joint regular visits to the wards, received feedback that 90% of customers are satisfied with the engineering services they received. This sort of response was not surprising and was expected because of cultural reasons, and it is also more difficult to say NO. A PPM questionnaire was given to all wards/departments in SMC patient care areas, and our customers have identified several concerns as follows:

- Certain times of the day were not suitable for PPM due to doctor's rounds and patient visits. In some areas, PPM work can only be carried out during weekends.
- Some disturbances and noise level was unsatisfactory.
- Customers are also concerned about cleanliness, early notification of work and work quality.

Alternative Solutions

Following solutions were considered to improve the quality of service:

1. Increase the overtime budget allocation for staff to be able to work outside normal working hours.
2. Delegate part of workload for some areas to the shift groups.
3. Re-schedule the PPM.

The first option was hardest to implement due to budgetary issues, as a tremendous increase in work hours are required. The second option was also difficult to put into practice as it meant adding extra work to the shift groups who also had their own PPM assignments, and adding staff required approval from higher authorities (this was tried in the past and was refused). The last option was the most appropriate solving a majority of the problem. By reorganizing the PPM schedule, putting in mind the user preferences taken from the user satisfaction survey form, staff and work was distributed on a weekly basis for all different departments. This schedule is made on a yearly basis (48 weeks) with one-week break every 3 months.

Implementation

New schedules were prepared that included the number of staff and their trades; and the team decided tthat by adjusting the PPM visit time to avoid doctors round time, the customer satisfaction could rise by at least 60%. Further improvement was achieved by educating the staff. PPM staff will inform the person in charge, get their approval, work efficiently and wisely and clean up after completing their work.
The newly modified schedule was computerized for one year to print out this proposal on work orders on a weekly basis.

Result

The satisfaction level of our customers was approximately 54%. The change in visiting time has raised their satisfaction to approximately 92% in this element. All other elements have seen an increase ranging from 8% to about 12%. The newly issued report has shown significant improvement where most work is carried out with approved access to site.

Recommendation for Continued Improvement

The implementation of the long awaited computerized Maintenance Management System, which will include plant history, technicians involved, parts availability, resource scheduling, etc. will lead to better results and improved consistency. Suggestion boxes at various areas will also provide a continuous source of data leading to continuous improvement of services.

Mahmood Al-Aali
Directorate of Engineering and Maintenance
Ministry of Health

Graduate Highly Qualified Nursing Students from the College of Health Sciences

Introduction

The high student attrition rate for the years 1995 and 1997 for the Post Basic and B.Sc. Nursing programs at the College of Health Sciences (CHS) necessitated the systemic investigation of the selection interview process in order to improve the quality of students graduating from these programs. This project is aimed at modifying the current selection interview guide and the interview grading form by establishing a team to service and modify the above. Alternatives will be generated; actions and recommendations will be discussed.

Problem Statement

The interview and selection process for the Post Basic and B.Sc. Nursing programs at the CHS does not give us students who are of the quality required.

1. The registrar's office of the CHS provided the following data to support the existence of the problem as follows:

- In 1995, a total of 33 students enrolled for both programs:
  - 22 candidates for the Post Basic Nursing programs (Psychiatric, Cardiac and Midwifery), of which 21 graduated and one was dismissed (attrition rate = 8.3%).
  - 10 candidates enrolled for the B.Sc. Nursing program, of which 4 graduated after 2 years (duration of the program), one withdrew due to poor academic performance, 3 were dismissed due to poor academic performance and 2 had to repeat certain courses and graduated after 2 1/2 to 3 years (attrition rate = 60%).
  - The total attrition rate for both programs in 1995 was 21.2% (many also got C and D grades).
- In 1997, a total of 29 candidates enrolled for the Post Basic programs:
  - There were 2 dismissals from Midwifery nursing, 1 dismissal and 1 withdrawal from Psychiatric nursing and 1 dismissal from Community nursing; a total attrition rate of 63.2%. This could increase as these rates are only from the first 2 months of the Academic Year.

2. A questionnaire consisting of 8 questions was designed and distributed to 20 people who participated in the interview process for the Post Basic and B.Sc. programs in 1995 and 1997. Analysis revealed the following:

- **Interview Guide:** 18 out of 20 (90%) indicated that changes are needed in the interview guide. Eight (40%) indicated that changes were needed in the section dealing with interest/motivation. Five (25%) indicated that the section dealing with professional experience was very important, but 4 (20%) indicated that this section was the least important. Two (10%) identified factors keeping applicant from successfully completing the program as the least important. Three (15%) suggested extra sections to be added to deal with coping, leadership skills and managerial abilities (especially for B.Sc. students) and 2 (10%) indicated discrepancies between the selection interview guide and grading form.
- **Interview Grading:** Ten (50%) indicated that Grade Point Average (GPA) and TOEFL and 8 (40%) revealed that the section covering professional activities such as continued education, reading professional journals and involvement

in committees were liked most.

- **Recommendation Form:** Eight (40%) indicated that changes were needed in the form while one participant stated that the form should be filled by the direct supervisor; but due to limitations on time for this project, this will not be included in the changes and will be considered for the future.
- **Overall Comments:** It was felt that the essay given on the interview day should be graded and the grade added in the grading form. It was also recommended that the interviewers should have a meeting to set consistency in grading criteria, and 2 participants suggested having a workshop on interviewing techniques and more stress given to GPA and TOEFL.

Objectives

1. Reduce attrition rate from 22.2% to 5% for post basic programs by 1999.
2. Reduce attrition rate from 60% to 20% for B.Sc. program by 1999.
3. Produce graduates with a minimum CGPA (cumulative grade point average) of 2.5 by the year 1999.
4. Compare admission criteria for the B.Sc. nursing program at CHS with other B.Sc. programs in Bahrain University and Arabian Gulf University (AGU).

Root Cause Analysis

The team, consisting of 4 Post Basic program heads and 2 from the B.Sc. program, interviewed 6 nurses who took either the Post Basic or the B.Sc. programs, among them 3 who were unsuccessful in their studies (2 dismissed, 1 who had to repeat courses). All 6 graduated from the AD nursing program between 1988-1991. Four of them had applied for their respective programs previously and were rejected.
It was found that the major obstacle facing all 6 was family responsibilities that interfered with their studies. The nurses in the B.Sc. program had to deal with commuting between Bahrain University and CHS for their courses, typing more essays, having more than 1 science course in the semester and one had difficulty with Islamic studies as she did not speak Arabic well.

They suggested some ways to improve educational performance in the future, such as stressing the importance of typing skills in nursing programs during the interview, course syllabus of the programs should be offered to the candidate when accepted to enable review of the topics covered in the programs and candidates who were dismissed or withdrew should be given a chance to enroll again. Changing the sequence of some of the B.Sc. courses, especially the science courses and emphasizing team spirit and teamwork in the interview were also indicated. They also felt that Islamic studies should be an elective and not a compulsory course.

Alternative Solutions

The team felt that comparing admission requirements of other universities needed to be studied, as well as conducting research into reasons for dismissal/withdrawal of students from the CHS. They also felt that reviewing and evaluating the curriculum of the programs needed to be done, but this would take a long time to complete. The following were suggested as other solutions:

- Raise the standards for accepting students by making the CGPA 2.5 rather than 1.7 CGPA as was done the past 5 years and conducting the TOEFL test at the American Embassy rather than the CHS (this was suggested by all heads of nursing programs).
- Offering the Post Basic and B.Sc. programs on a part-time basis since social and family commitments were of prominent concern to all students interviewed.

- Avoid putting 2 science courses in one semester in the B.Sc. program. This is difficult to implement as course sequence has to be approved by the CHS Academic Council, but it was conveyed to the head of the B.Sc. program.

The team decided to implement the following after discussing the issues:

1. Admission requirements for only the B.Sc. program were compared to those of Bahrain University and Arabian Gulf University as these institutions offer post basic programs at different levels. It was found that admission requirements of CHS match the requirement of AGU except for the high school science score (65% and above for CHS and 85% and above for AGU).
2. Evaluate and modify the current selection guide.

Implementation

The team circulated a questionnaire to interviewers for comments/suggestions, a team was formed from heads of programs and senior faculty to decide on the changes and each member was given a task to achieve/recommend changes. Modification of the interview guide and the grading form was done after studying the recommendations and interviews with former students, using the 7-point plan recommended by O'Boyle (1990) as framework. The modified forms were distributed to team members for their comments, and a pilot test was carried out with two possible future candidates for the B.Sc. program.

Conclusion and Recommendation

Faculty from other divisions and people in service should be on the team to get different views. Responsibilities of team members should be delegated earlier in order to complete the task on time. Personality/psychological tests should be used with prospective applicants in order to get good candidates. A separate biographic data form should be filled by candidates and submitted on the interview day. Training should be provided on how to conduct interviews and orientation given about the new forms so as to get consistent results, especially those who did not conduct interviews previously.

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New Procedure for Work Requisitions

Introduction

Among the major services provided by the Directorate of Engineering and Maintenance to its internal customers is the provision of engineering services (air-conditioning, electrical, lighting, hot and cold water) and the repair and maintenance of buildings and engineering equipment. Maintenance technicians carry out two types of activities to maintain the effectiveness and reliability of the Engineering Services:

- Planned Preventive Maintenance works which are carried out on periodic basis and are scheduled without customers' requests, and
- Repair works and other improvement works that are normally requested by customers though work requisitions, and these are where the customers assess and value the services provided and works carried out by the Maintenance Section.

Problem Statement

After conducting a survey and interviews with customers to identify their level of satisfaction with the services provided by the Maintenance Section, we found that they were not very satisfied with the response and information they receive about their work requisitions, and that some work took longer than expected for various reasons. Many customers had difficulties communicating with the concerned personnel in the Maintenance Section to follow-up on the status of their work requisitions. Data showed that the average time from customers sending a requisition, to the work completion and entering data into the computer took approximately 12.43 days. Most of this time is taken the handling of the work requisitions and not the actual work itself. Our goal was to reduce this time by at least 50% by implementing a change in the method of submitting the work requisitions and ensuring that the information is readily available to customers.

Root Cause Analysis

A CQI team was formed using Belbin's Team Roles in the selection of nine members among whom were engineers, technicians and one hospital Administrator.
I used Belbin's Development of Team Skills Questionnaire to assess the capabilities and characteristics of each member of the team to ensure that they would play effective roles in this project. After many meetings, the team designed and distributed a questionnaire to all sections in the Ministry to evaluate customer satisfaction and key characteristics of the services provided, as well as problem areas. Results of the survey and interviews indicated that many customers were not satisfied with the information they received from the Maintenance Section when they wanted to follow -up on the status of their work requisitions in case of delays in completion of their work.
A Fishbone analysis carried out, revealed the root causes of the problem as follows:

- **Lost Work Requisitions:** We found that delays were caused when some requisitions were not entered into the system. Weekly progress reports, which are presented to the Management on completed and pending works, therefore did not show those work requisitions that were not entered in the system; and accordingly, no action would be taken by management to expedite such works.

The absence of one procedure to submit work requisitions allow customers to follow different methods for submitting their work requisitions.

1) Some customers send their work requisitions to the Maintenance Section by internal mail.
2) Some customers use drivers to deliver their work requisitions
3) Some customers send their work requisitions to the Foreman/technician on site
    - Sending work requisitions by mail cannot be used for urgent or semi-urgent works, as these requisitions may not reach the Maintenance section on time or may not reach for various reasons. The users have no record of evidence that the requisition has reached the Maintenance section.
    - Using drivers to deliver requisitions to the Maintenance section is time consuming and not cost-effective. Using vehicles and drivers for this purpose can be regarded as improper use of resources.
    - Giving the work requisitions to the Maintenance foremen/technicians is sometimes very effective when the work is urgent and minor, and can be carried out by the technician on-site at the same time. However, for other works, this method does not guarantee that requisitions are entered into the system; they might be lost or misplaced.

- **Difficult contact:** Some customers found it difficult to contact the foreman **(accessibility)** to ask for information on the status of some work requisitions.
- **Delays in delivering information:** Some customers complained that the foremen take a long time to submit information about the status of their work **(Responsiveness)** due to other commitments or priorities.
- **No regular reports to customers:** Some customers complained that they do not receive regular reports from the Maintenance Section, which are useful in following up on their requisitions and will highlight delays in completing work.

Alternative Solutions

After analyzing data from the surveys and interviews, the following alternatives were recommended to improve accessibility for customers and responsiveness by maintenance staff to requests on the status of their work requisitions.

- **Option 1:** Customers should send their requisitions by hand to the Maintenance Section Office to ensure that their work requisitions are entered into the Central Database System of Work Requisitions. This method will ensure entry into the system and follow-up on status of works, but it will consume more resources and is not practical in case of emergency work.
- **Option 2:** Instead of delivering requisitions by hand, customers should call the Maintenance Section and give their requisitions by phone. Their work requisitions will then be entered immediately into the system, and they will be given a reference number that can be used to follow-up on status of their requisitions. The work requisition should then be printed out and handed over to technicians to carry out the work. This solution not only eliminates unnecessary use of drivers and vehicles to deliver work requisitions to the Maintenance section, but will also eliminate lost requisitions sent by mail or by giving it to technicians on site.
- **Option 3:** The use of inter-Ministry email to send work requisitions was considered as this will have the advantage of immediate delivery of work requisitions to the Maintenance Section, who will not have to allocate someone only for the purpose of receiving requisitions. However, using this method will not provide reference numbers to users, besides email facilities are not available in all Ministry facilities.

Option 2 was considered to be the best solution, as it would increase customer's satisfaction, information would be up-to-date in the system, no lost Work Requisitions, one central contact for providing information to customers and elimination of drivers and vehicles to deliver Work Requisitions. This would have support from the Director and acceptance from customers, although the restraining forces would be only one dedicated person to receive customers' telephone calls with calls accepted only during working hours and possibly an increase in the number of Work Requisitions due to the ease of making them.

Implementation

Meetings were held with all foremen in the Maintenance Section to explain the proposed changes and to gain their commitment to the new procedures. A two-way communication followed to demonstrate that the proposed change would provide an improvement in the services to overcome reservations expressed by some foremen and customers. The following arrangements were made before implementing the change:

- The data-entry office in the Maintenance Section was shifted to a new office to accommodate two employees, to ensure that there will always be someone to receive customers' telephone calls.
- A new direct telephone line was installed in the office to facilitate easy access by customers, and it would be used only for the purpose of receiving customers' work requisitions and enquiries.
- The computer program for entering data was modified to allow printing of work requisitions in the Maintenance office, since customers will not send their work requisitions to the office.

The following procedures will be followed:

- Customers call the Maintenance Section and make their work requisition
- The work requisition will be entered into the system immediately and the cus tomers will be given a reference number for their requisition.
- The work requisition will be printed in the Maintenance office and handed over to the foremen/technicians for execution.
- The completion date is entered into the system after the completion of the work.
- Customers call the Maintenance section should they have any enquiries regarding the status of their work or to ask for a report.
- Weekly reports are printed out and sent to all customers by fax or using email. These reports will include information about works requisitions received, completed and pending works.

After involving major customers, it was decided to start by implementing the change with the Psychiatric Hospital for two months to evaluate the new procedures and solve any problems before implementing the change in other facilities. The Psychiatric Hospital was chosen as it is the largest hospital in the District section and one of the facilities from which the most complaints about services were received.

Results

The following results were achieved after implementation of the change at the Psychiatric Hospital:

- Average time from writing work requisition to entering it in the system was reduced from 11.84 days to zero.
- Average time from completion date to entering the data after completion was reduced from 4.55 days to few hours as the data was entered on completion of work
- Average time from entering date of requisition to entering data after completion of work was 1.94 days
- Average time from writing work requisition to entering data into computer after completion of work was reduced from 13.77 to 4.77 days (65%)
- Average number of reported lost requisitions was reduced from 15 requisitions per month to nil as the requisition is entered directly into the system.

After these major changes, it was decided to implement the change for all customers effective 1st January 2002

Recommendations

Use Information Technology, after completion of the Ministry's communication infrastructure, to improve the system of receiving work requisitions and allow customers to have immediate access to information on the status of their work requisitions. It will make the improvement more effective by allowing customers to make their requisitions at any time, not only during normal working hours. They will have all information available on their monitors and will eliminate the need to allocate two persons in the Maintenance Office just for receiving work requisitions and sending reports to customers.

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Implementation of Case-Based Curriculum in Nursing Education at the College of Health Sciences

Introduction

In 1998, the Nursing Division at the College of Health Sciences implemented the case-based curriculum, which was developed by the Curriculum Planning Taskforce set up by the Ministry of Health. The change in curriculum was deemed necessary in order to satisfy the needs of the learners, faculty and the community at large. The process included developing consensus for change, reviewing beliefs, perception and definition of the main concepts of the metaparadigm of nursing and related concepts, identifying the characteristics of individuals, families, community and learners. Implementation of the change started with the Associate
Degree Nursing Program.

Problem Statement

Prior to implementation of the curriculum, cases were developed and reviewed; knowledge sharing with other institutions and faculty were oriented to the features of the curriculum. Although the faculty were involved in the process of curriculum development, they were reluctant to implement it at the appointed time. To facilitate the implementation of the new curriculum and to monitor progress, it was decided to establish base-line data on teachers' readiness and preparedness for the change that would help focus on the areas of faculty concern and alternative ways to deal with their concerns. Results of a questionnaire showed the following concerns that would adversely affect faculty and students in terms of hindering implementation of the curriculum:

- Limited time for implementation
- Inadequate support and guidance
- Inadequate knowledge about case-based teaching methods
- Inadequate readiness to teach with cases

Root Cause Analysis

Using Belbin's Team Roles, a committee was set up to investigate and find ways of solving the problem and improve the quality of faculty knowledge and performance in implementing the case-based curriculum. Results showed that faculty were concerned about the following:

1) Unawareness and lack of knowledge about teaching with cases
2) Lack of faculty preparation
3) Time constraints that limit faculty from being able to keep abreast with current information about case-based teaching methods
4) Resistance to change
5) Limited time to practice teaching with cases before actual implementation
6) Lack of resources such as expert personnel, books, pool of cases, etc.

Tool Development

A questionnaire was developed after extensive review of literature on case-based curriculum in nursing education. Consisting of three sections, the questionnaire focused on: Teachers' perception about teaching, thoughts about the implementation of the case-based curriculum, and student-related and faculty-related concerns about teaching with cases

The questionnaire was distributed among 41 faculty; response rate was 80%; analysis revealed the following data:

- Teachers' conception of teaching:
  - 30 (90.9%) faculty reported that learning is a two-way interactive process between learner and teacher.
  - Thoughts about the case-based curriculum: 29 (88%) faculty reported that case-based curriculum encourages critical thinking and problem-solving rather than just remembering facts.
- Students-related concerns:
  - 19 (57%) faculty reported that students' traditional educational background was the main obstacle that hinders the progress in implementation of the case-based teaching method. 19 faculty also reported their concerns on students' ability to change their conceptions regarding their roles as active learners.
  - 26 (78.8%) faculty reported that they were concerned about their readiness to teach with cases.
  - 25 (75.8%) faculty reported that they were concerned about inadequate support/guidance during implementation of the curriculum.
- Additional reported concerns were:
  - Limited clinical experience, reduced contact hours, end product of the graduates, going back to the traditional methods.
- Faculty-suggested mechanisms to deal with faculty concerns were as follows:
  1) Continuous support and constructive feedback
  2) Teamwork
  3) Formal and informal evaluation by experts
  4) Faculty self-preparation
  5) Simulation sessions
  6) Better teaching/learning resources

Alternative solutions

Based on identified causes, the following solutions were suggested:

1) Faculty workshops on "faculty preparation for implementation of case-based curriculum"
2) Simulated practice sessions on case-based teaching
3) Peer evaluation during classroom teaching
4) Continuous constructive feedback
5) Support/guidance from experts
6) On-going presentations and discussions on group teaching and teaching tips

Implementation

Lewin's model of change was used effectively to change faculty feelings of uncertainty about their abilities to implement case-based approach to teaching.

Unfreezing: Results of questionnaire that provided base-line data about faculty's uncertainty was communicated to all faculty. Faculty were involved in putting the objectives of the workshop and how they would like to achieve those objectives. This created a feeling of commitment to change. All 41 faculty were informed about the workshop. Details and reading material were distributed. Three faculty members were involved in conducting the workshop. One faculty was assigned as facilitator and the rest of the faculty acted as students.

Refreezing: After completing the workshop, faculty continued with their teaching

assignments. Peer evaluation, team teaching and constructive feedback was encouraged to stabilize the change. They were instructed to change the content of cases as the need arises. Regular faculty meetings were held to update the curriculum planning taskforce on progress and identifying concerns.

Results

Results of the post workshop questionnaire revealed that 75% of the faculty reported reduction in frustration and uncertainty levels. They also suggested that more time was needed to prepare and process the cases before teaching, identify support group and formulate small groups to monitor implementation, in addition to regular meetings and presentations on key issues and concerns, on-going workshops and simulated sessions.

Recommendations

Inherent in the CQI cycle is the on-going evaluation and modifications of action plans. The leader of the project should balance the three components of leadership: focus on the task, focus on the team and focus on the individual:

1) Monitor and evaluate faculty skills and knowledge.
2) Allot time to prepare and revise cases before implementing curriculum.
3) Recruit a consultant as resource person during the implementation phase.
4) Identify key faculty who can act as mentor for the faculty.
5) Conduct more simulated sessions on processing case studies.
6) Preparation of students adequately to facilitate the process of processing case studies.
7) Establish built-in evaluation system to continuously monitor process of implementation.
8) Develop evaluation tools.

Conclusion

A number of strategies have already been carried out and other strategies are suggested. Periodical evaluation is an important strategy and there is no end to CQI program. As each action plan goal is achieved, a new one should be developed so that further increment improvements can be obtained.

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Increase Effectiveness of Performance Management Program at Five Ministries

Introduction

Following directives issued by H.E. The Prime Minister to implement performance management programs in all Ministries that provide service to customers (Bahraini citizens and non-citizens), the Civil Service Bureau selected directorates in ministries providing customer services, as pilot directorates for the entire ministry.
Our section "Performance Management" team had the responsibility to deliver the program to ministries, collect and analyze responses and give the feedback to the directorate for implementation, which will be evaluated and progress reports will be sent to the CSB twice a year.

Problem Statement

The Ministries were not giving this program adequate attention. Despite regular reminders, they do not send employees' performance management evaluation forms or regular progress reports. If ministries do not continue to send the required information, the program will not serve the main purpose, which is to increase performance and productivity. The management team, formed according to Belbin's Team roles, aimed at increasing the effectiveness and responses within six months from 35% to 90%, to ensure employee satisfaction and increased productivity, thereby increasing customer (Ministry) satisfaction.

Root Cause Analysis

The team decided to visit the concerned five Ministries, i.e. Ministries of Justice & Islamic Affairs, Oil & Industry, Housing, Labor & Social Affairs and Commerce to get a general feedback on reasons for not complying with the program before initiating a specially designed questionnaire for employees and supervisors. Results of the questionnaire were as follows:

- 90% of supervisors said that there was not enough budget to secure the support needed requirements.
- 79% employees said that no attention was given to support needed column.
- 78% employees felt that there was no one to follow-up on the program and update them on new developments.
- 69% felt that the performance management program was not linked to incentives, promotions, training or disciplinary action.
- 60% thought that there were no clear performance standards.
- 49% said there were no job descriptions.
- 48% indicated that they did not have mission and vision in their directorates.
- 45% said the performance management form was not clear.
- 40% said that employees were not given the right to express their views.
- 35% said that they were satisfied with the performance management program.

Alternative Solutions

1) The team contemplated short-term solutions to fix the problems quickly and in later stages, through continuous development study, resolve the other problems.
2) Redesign and amend performance management form to a more concise and simple one.
3) Performance improvement goals: after discussion with concerned officials, it

was agreed to link performance standards with actions (incentives, promotions, training, disciplinary action). Training was conducted through Administrative and Finance Sections in each Ministry.

4) Follow-up: it was agreed to form a team from each ministry to act as links between that particular ministry and the management team. The teams were formed according to Belbin's Team Roles and were trained to take over the responsibilities of follow-up and training of employees on the program, communicate continuously for consultation and provide the management team with monthly reports. In return, the management team would update individual teams on new developments and continuous consultation.
5) Guidelines were issued to supervisors regarding the problem of budgetary constraints. One of the solutions was that ministries had to efficiently prioritize financial resources to achieve required goals, to minimize cost of training by utilizing employees who have been trained to train other employees.

Implementation

Unfreezing started with appropriate training for supervisors and employees on the goals and solutions for improving the services.

A pilot study was carried out in the Ministry of Oil and Industry. After training, supervisors and employees expressed their satisfaction with the new changes and their willingness and commitment to keep up with the program, which was later implemented in the other ministries. To reinforce the change, refreezing was initiated by sending ministries letters of appreciation for the excellent progress to date, requesting them to continue providing feedback to ensure further and continuous improvements to the program.

Results

After three months of implementing the changes, the team found that the target was achieved. The satisfaction rate showed an increase from the previous 35% to a new level of 82%, which indicated that employees were more comfortable with the progress of the program. They also noted that as a result of the procedural changes, supervisors have realized the importance of performance management forms in the incentive process, and were submitting forms with recommended incentives for outstanding employees.

Recommendations for Continued Improvement

a) Efforts must continue to resolve the other elements of the questionnaire where the percentage of dissatisfaction was found to be high.
b) Expert advice should be sought to assess and recommend improvements to the system that we have in place, and follow the directives of H.H. The Prime Minister in the mission of a more efficient and productive organization in the new millennium.
c) Efforts should be made towards easing budget constraints, as the program is budget dependent.
d) Follow-up and monitor progress of the program and encourage suggestions for change to ensure continued improvement.

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Improvement of the Performance Appraisal Process

Introduction

Many definitions of Continuous Quality Improvement exist, yet they all have several elements in common. 1) improvement of services, outcomes and products, 2) importance of data collection, 3) focus on customer satisfaction, and 4) decentralized team approach to improvement that includes front-line staff (Benjamin, Mandil and Seman 1998). In this project a continuous quality improvement program will be implemented to increase the satisfaction rate of the Nursing Division faculty at the College of Health Sciences with the Performance Appraisal process.

Background Information about Performance Appraisal Process at the Nursing Division

The College of Health Sciences (CHS) evaluates the performance of the faculty once a year, using the performance appraisal form that is designed by the Civil Service Bureau (CSB) for all Government employees as a tool to measure staff performance. The form consists of eight performance elements that are rated from unsatisfactory to outstanding, and are sent to the Dean of the College of Health Sciences at the beginning of each academic year to be completed within 1-2 months, and returned to CSB. The Dean's office sends the forms to each division for completion, by the chairperson and heads of programs. In the Nursing Division, faculty members are asked to do a self-evaluation for the previous year, then the head of the program interviews and evaluates faculty before returning the forms to the Dean's office. A copy of the completed form is given to the faculty, while another copy is kept in their file in the division concerned.

Problem Statement

Eighty percent of Nursing Division Faculty are dissatisfied with the Performance Appraisal process.

Problem Assessment

While the Nursing Division faculty are aware of the performance appraisal process practiced in the College of Health Sciences, they are not satisfied with the process. Reasons for their dissatisfaction were identified as follows:

- Majority of faculty are rated outstanding without following a proper evaluation system.
- There were no yardsticks for measuring performance. Nobody knew on what basis the faculty are to be evaluated.
- Evaluation is annual, not regular.
- No proper feedback was given to faculty to improve productivity and performance.
- Neither heads nor faculty were serious about the performance appraisal.
- There was no fairness in rating, personal influence affects the raters.
- Rating was neither objective nor interactive.
- The form was not appropriate.

Objective

To decrease the level of dissatisfaction among Nursing Division faculty from 80% to 40% by the year 2003.

In order to increase faculty satisfaction and motivate them to perform their tasks

and accomplish the mission of the Division and the College, it was decided to establish a base-line data on faculty opinion about the performance appraisal process. This data will help focus on areas that faculty are dissatisfied with and alternative ways of dealing with the problems. Therefore, an opportunity for improvement exists in the Nursing Division to overcome faculty dissatisfaction with the performance appraisal process. This goes in line with the new strategic plan of CHS.

Root Cause Analysis

Using Belbin's team roles, a committee was formulated to review the problem and identify the best solutions. Members were selected based on their experience and strengths, motivation and prior involvement with the performance appraisal process. Following the second meeting the team designed and distributed a questionnaire among members for comments. After discussing the feedback, members decided to distribute the questionnaire to faculty. Results of the questionnaire were then discussed at subsequent meetings of the committee that finalized and approved a plan that was submitted to the chairperson for endorsement.
Analysis of all data obtained revealed the causes of faculty dissatisfaction with the performance appraisal process. All possible causes were presented in the Ashicawa's Fishbone diagram, and the main causes can be extracted from the methods used to investigate the problem.

1. **Analysis of results of performance appraisal**
   Results of performance appraisals for the 1999 and 2000 revealed that the majority of faculty were rated outstanding, as shown in the following table:

Program	Outstanding		Very good		Good	Satisfactory	Unsatisfactory
AD Nursing	15	42.8	8	22.9%	-	-	-
Nurse Midwifery	3	8.5	-	-	-	-	-
Community Nursing	2	6.7	-	-	-	-	-
Cardiac Care Nursing	**2**	5.7	-	-	-	-	-
Psychiatric Nursing	2	5.7	-	-	-	-	-
B.Sc. Nursing	3	8.5	-	-	-	-	-
Total	**27**	**77.1%**	**8**	**22.9%**			

2. **Questionnaire on "the opinion of nursing faculty about the performance appraisal process"**
   A small questionnaire consisting of seven questions was distributed to 39 faculty. Thirty completed questionnaires were received. The response rate was 77%.
3. **Comparison between the CHS performance appraisal process and that of the Arabian Gulf University (AGU).**
   The AGU performance appraisal process was used to compare it with CHS. AGU was selected because of the similarity of some of their activities, e.g., theoretical and clinical teaching. Data was obtained from the office of the Dean of Medicine. On comparison, it was found that the AGU performance appraisal process was different in the following areas:
   1. AGU uses an appraisal form which is designed by the University and concentrates on academic performance
   2. There are specific areas for each performance standard.
   3. There are yardsticks for the criteria stated in the annual evaluation form.
   4. The process is interactive.

Data obtained from the questionnaire was analyzed, using descriptive statistics. Frequency distribution and percentage were used to summarize the response that revealed that only 6 faculty were satisfied with the process (this was because they were used to it). Of the 24 faculty who were dissatisfied, it was found that most felt that the process was not fair, not a proper rating system, has nothing to do with promotion, not interactive, influenced by personal feelings and that the form was not appropriate to them as they felt that teaching capabilities, professional development and contribution to CHS and community are more important. They also felt that self-evaluation was a better rating system.

Alternative Solutions

- Develop performance standards and criteria for those standards that are appropriate with faculty job description.
- Prepare a rating methodology plan.
- Prepare a plan to promote, reward and develop people, based on the appraisal performance results.
- Performance evaluation should be done every semester.
- Feedback should be planned, constructive and objective.
- Discuss the results of the CQI project with the faculty and present the new standards to them.
- Train heads and faculty on effective performance appraisal process.

The selected solutions

The solutions selected were:

- To develop performance standards and criteria for those standards that are appropriate with faculty job description, and
- To prepare a rating methodology plan.

Job analysis and job description are essential instruments of behavior technology used in performance appraisal. They provide objectivity and discriminate among jobs (Swansburg 1996). It is advocated to make performance appraisals more objective as part of a system, the theory being that multiple ratings will give a more objective appraisal (Swansburg 1990).

Implementation

Lewin's model of change was used to change the performance appraisal process. The following steps were followed:

(a) Unfreezing

1. The need for change was identified by team members and the faculty in the questionnaire.
2. Discussion on what should be done took place between team members.
3. Faculty were involved in putting the performance standards and the rating methodology through the questionnaire.

(b) Implementation

1. Performance evaluation form, criteria for evaluation and the rating methodology plan were prepared and approved by the team members.
2. The new process will be implemented after getting the final approval from the Academic Council in the new academic year (2001 - 2002). Before implementation of the new process, the results and the plan will be communicated to the faculty through a one-day workshop.

(c) Refreezing

This stage was not achieved, as the actual implementation was not done.

Feedback was given to all the team members. Thank you letters were sent to team members. The forms will be officially used after those concerned approve it.

Recommendations

As the leader of the project, I recommend the following in order to succeed in our plan:

- Since the College is a governmental sector and is required to use the appraisal form that is designed by the CSB, the new form should be used internally and should be attached to the CSB form.
- The goal of the performance appraisal should be to stimulate motivation of employees to perform the tasks and accomplish the mission of the College.
- The performance appraisal process should also be used to govern corporate direction in selection, training, career planning and rewarding of faculty.
- The heads should be trained that performance appraisal requires careful planning, information gathering and an extensive format interview.
- Praise or suggestions for improvement should be done at the time of feedback.
- Heads should be rewarded for good performance evaluation skills.
- Use multiple rating approaches.
- Review job descriptions and propose changes.
- The faculty should be given the job descriptions to refresh them with what is required of them.
- Review performance process regularly.

Conclusion

There was no time to implement the change because the annual appraisal was completed before the completion of the new form. Other strategies are also suggested. After implementation of the new process, an evaluation should be done to find out if the process was successful or not.

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Cost Reduction Through Use of New Technologies

Introduction

Re-classification of Individual Positions is one of the many services that Classification and Compensation Directorate (CCD) of Civil Service Bureau (CSB) carries out. The Re-classification involves performing reviews, studies, standards and organizational charts, and the like. This process and lack of practical system are unnecessarily wasting resources, such as manpower, time, money, office equipment. etc. This research is intended to find ways to take advantage of new technologies to reduce costs (money) as main resources, as well as the adoption of a new system that suits CSB's current status.

Current Re-classification Status

Current re-classification analysis depends mainly on written methodology, mainly Classification Standards that analysts rely on heavily in job evaluation/classification, through the application of positions' duties and responsibilities in the Position Description (PD) to said factors in the standards to allocate position grades.

Problem Statement

Written methodology "Standards" is inaccurate, arguable and does not produce fast results. This method causes many problems such as inaccurate results when allocating grade. The process to reach an acceptable result is time consuming because of the correspondence policy between the Ministries and the CSB. The possibility of false decision-making is high because of the involvement of the written methodology that does not depend upon scientific facts used in other substitute methods, but rather, upon powerful writing skills. The above problems lead to requiring a larger number of employees. The total cost of man-days for classifying these positions is BD130,221.

Our aim was to increase effectiveness of the program and increase the response received from the Ministries from 40% to 80% in one year. This will affect the cost reduction of the services provided by CSB to the Ministries and reduce the workload that causes after duty hour work. Ministry employees will then increase the job satisfaction and productivity.

CSB is directly affected by the long procedure of reaching an acceptable result, as the Classifiers' time is wasted. The Ministries are indirectly affected by the re-classification studies. Any delay in such studies causes setback in appointing new recruits who, in turn, perform the work that would otherwise stay at halt. The delay would also affect the efficiency and quality of work of those employees who are awaiting promotion.

Root Cause Analysis

We investigated through the files, classification procedures and the ISO sheets that showed the target dates. Using brainstorming technique, the team agreed that the way of collecting, analyzing and presenting final recommendations should be in accordance with the Civil Service Bureau's rules, regulations and resolutions.
Since the current system is in use, the changes and the period of the study are to be discussed with all potential personnel that may be affected.

Ministries raised different and multisided views in this issue as follows:
The length of the procedures caused by the delay of the projects taken from the records, work stress, complaints received from the Ministries and overtime paid to the employees cause problems. Also, CSD Directorates have other priorities than concentrating on the procedures.

Alternative Solution

The team decided to concentrate first on how to make changes of the actual standards that were applied a long time ago. This was solved on the basis that the changes are acceptable if the proposal is to improve the working procedures and reduce the cost. The team has proposed a system that applies appropriate, concrete procedures that meet the classification principles that can the solve long period of evaluation and analysis and inaccurate results. We agreed the most appropriate method that could possibly solve the problem is the point rating method, which is applied in some international countries and neighboring countries like Saudi Arabia. We had frequent communication with International offices that deal with position classification analysis and classification standard development using the point rating. Philadelphia Civil Service Regulation provided us with their proposal, the cost of installation of this new system and the possibility of using automation in order to reduce self-judgment and speed up the procedure.

Finally, we found an office where they apply and install the point rating system to be installed into our classification system and to replace the current system that we consider obsolete. In this way we have achieved our main goal of replacing the old system and solved the past problems.

Implementation

We started to test and develop standards by using point rating for some positions using Factor Evaluation System known as FES. Subsequently, we applied random samples of positions on the new FES system, and we found that this system can be applied without any major difficulties. To make sure that this system is applicable, we selected team members taking into account Belbin Team Role.
Based on the above, we agreed that we should adapt specific steps so that we can implement the project as follows:

- **Installing automation:** It is a system followed in classifying positions by point rating automatically by considering classification factors.
- **Training the staff on point rating:** Staff should be trained on how to evaluate positions individually by giving points based on references.
- **To use the point rating and clear criteria:** Develop standards, guidelines and benchmark for every group of positions in order to establish point rate levels for those groups and clarify the levels of positions
- **Installing a personal computer for every staff:** PCs are very effective tools to use for classifying positions using point rating system.

Results

The team made a presentation of the solution to the top management of the directorate to convince officials to adopt this alternative, and later approved the proposal. We found that the application of this system is practical, staff can be trained easily and consumes 60% less than the current system.

This table refers to the year 2001

No.	Service	Std. Day	Freq.	Total Act. Days	Cost/ Service (BD)	Total Cost (BD)
3a	**Re-Classification of Individual Positions**-1 or 2 Classes	28.2	53	1484	1364.4	72313
3b	**Re-Classification of Individual Positions**-3 Classes and Above	40.2	3	120	1939.8	5819.4
Total		68	56	1604	3304	78132

No.	Service	Std. Day	Freq.	Total Act. Days	Cost/ Service (BD)	Total Cost (BD)
3a	**Re-Classification of Individual Positions**-1 or 2 Classes	18.8	53	1484	906.6	48208
3b	**Re-Classification of Individual Positions**-3 Classes and Above	26.8	3	120	1293.2	3879.6
Total		68	56	1604	3304	52087.6
Difference						40%

After applying Belbin Rules in quality improvement, we have improved working procedures and have improved the efficiency by decreasing the working days as shown on the tables above. The total cost has reduced from BD13,0221 to BD52,088 (40%). Therefore as it is observed from the table, the efficiency has increased from 40% to 80%; that means the ministries are more satisfied.

Recommendation for continuing improvement

For continued improvement, it is necessary to train all concerned employees of CSB and Ministries. Produce copies of the standards and manuals to be used by the personnel in the Ministries. Encourage top officials in all Ministries to adapt such systems and programs to reduce costs.

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Civil Service Bureau

Experiential OJT Course Evaluation

Introduction

The Pharmacy Technician Program is one of the Allied Health Departments at the College of Health Sciences (CHS) in the Ministry of Health. It offers scientific education and experiential training in various pharmaceutical operations leading to the Associate Degree (AD) in Health Sciences. The major goal of the program is to train competent pharmacy technicians who will assume responsibility in delivering care in various pharmaceutical settings through an intensely structured experience aimed at improving the educational experience. It encourages students to expand and integrate the didactic knowledge gained with the practice of contemporary pharmacy (Boh, Pitterle, Schneider and Collins, 1991).

CHS, whose vision is based on values that emphasize quality, enjoys international recognition as a regional center of excellence in health education, research and development, and quality faculty and graduates. The curriculum consists of didactic, laboratory and practical courses, distributed over 5 semesters and two summer sessions, and includes professional, College requirement and pre-requisite courses, with credits totaling 70. The percentage of didactic to laboratory, practical course is 30% - 70%.

Problem Statement

To graduate as pharmacy technicians, students are required to successfully complete all the requirements of graduation, which include passing all the didactic, practical and experiential OJT courses, starting with the practical courses until they reach the experiential OJT course (PHA 250) which is the last course in the curriculum.

Student's grades in the 3 practical courses (PHA 243, 244, 245) were higher than grades obtained in the experiential OJT course (PHA 250), which to me is a contradiction and illogical sequencing of attainment because of the following:

- OJT students must perform with utmost proficiency, accuracy and minimum supervision. They are required to master all the skills and competencies by the end of the experiential rotations in order to graduate and work as pharmacy technicians, but the grades do not reflect this attainment.
- During practical courses (1 and 11) first weeks' rotations, students' scores were very high, and they got full grades on those rotations. To me this is unusual because this is the students' first encounter with the practice site; and their baseline skills are very minimal if not any, as it is their first learning experience.
- Grades of the same students do no correlate in the 3 courses and the OJT (except for distinguished students). This was a frustrating experience to both students and myself (experience in the last batch 2000).
- The percentage of students who obtained "A" grades, in the experiential OJT course (PHA 25)) constituted only 28.6 - 36.4% of the whole group compared to 42.9% - 100% who obtained the same grade in the 3 practical courses (PHA 243, 244, 245).

Teams are powerful tools for unleashing an organization's creative and problem-solving capabilities (McDermott, Waite and Bratwley, 1992); and the process of CQI is a team-based process, which depends on formulating an effective winning team.
I formed a balanced team of 6 pharmacists with various talents and skills, repre-

senting various aspects of drug management areas, bearing in mind that according to Belbin's (2000) a "balanced team" is to be formulated "where individual weakness can be both tolerated and compensated for, provided there is someone else in the team with relevant strength". I provided the team with the background summary of these courses and briefed them on the concerns I had regarding the evaluation of the students in the four courses. After reviewing the data I provided, the team was convinced that students could perform better in OJT or at least the same as the practicum courses; so a SMART goal was finalized, i.e., increase the percentage of students scoring "A" on the experiential OJT (PHA250) courses from the present 40% to 85% by December 2001.

Root Cause Analysis

The two quality tools that are used in the CQI process, i.e., Fishbone diagram and Pareto Chart were used to analyze the root causes for the lower scores of the OJT as compared to the scores in the three practical courses. The team considered the following as the most important elements for the solution:

1. Oral Comprehensive examination 50%
2. Practical Compounding Examination 30%
3. Observation of the dispensing/communication 10% skills

Alternative Solutions

After discussing various options and talking to students, the following solutions were suggested:

1) Improve both the practical and the oral comprehensive examinations.

2) Improve the evaluation checklists.

3) Work on preceptors and students' causes of problems.

• Solution No.1 was considered to be the most practical, feasible and objective solution because the examinations (40% of overall course grade) contribute most to the problem. Moreover, evaluation checklists are shared between the practical courses and OJT. The students score 90% - 100% in them. It was considered as being more objective while the alternative No.3 was more subjective. It involves changing attitudes and behaviors of people (students, preceptors), training for preceptors, interference from administration, etc.

Planning for Change

- An orientation session was held to brief students on examination procedures, site of exams and the team names
- Change of location of examination from the health center pharmacy to CHS classroom, provide quiet environment aimed at reducing anxiety levels and ensure students' concentration while answering written exams.
- Subjective oral questions to be minimized by examination team.
- Ensure that students visit pharmacy before exams to familiarize themselves with environment settings, staff, procedures, preparations, compounding equipment, glassware and containers, bulk preparation, etc.
- Ensure adequate arrangements with minimal distractions, availability of all necessary material and equipment during the exams.
- Written exams are to be conducted first to reduce anxiety level and increase students' concentration during the verbal (oral) exams.

Implementation

According to Lewin's model for change (cited in Griffin, 1999) the process of change involves 3 steps:

Step 1: Unfreezing the situation "individuals who will be affected by the impending change must be shown why the change is necessary". This was accomplished by arranging for an orientation session for students, preceptors and pharmacists, providing them with information on problems encountered by previous batches of students to support the direction for change.

Step 2: Implementation: Compounding practical examinations were conducted for two groups of students (3-4 students per group) on two consecutive days. Examiners observed and evaluated each step in the compounding process, and the oral part of the exam was conducted after the students completed the preparation or during the time spent waiting for especially long procedures in filtration/mixing. Each evaluator rated students independently for reliability; and their assessment covered communication skills, prioritizing of the procedural steps, and judgmental skills. The Oral Comprehensive Examination was conducted for all the students on the same day at CHS, with each of the five examiners rating the students at first, followed by discussion and finalizing the grades to be registered for each student.

Refreezing involves reinforcing and supporting the change so that it becomes part of a system (Lewin cited in Griffin, 1999). Changes introduced in the practical compounding exam, the oral comprehensive exam and the evaluation checklists are institutionalized, reinforced by incorporating them as standards and components of overall evaluation of the performance in the experiential course (OJT).

Results

The following results are before and after introducing the changes in the oral comprehensive and the practical compounding examination. Table No. 1 shows the improvement in the students' grades for the OJT (PHA 250) course. 85.7% of students got grade "A" on the OJT, only 14.3% of students scored a high B (87%). Table No. 2 shows that only 35.96% (28.6% - 42.9%) of students obtained "A" grades in the OJT before introducing the change.

Table No. 1: Students Grades (2001) batch (after change)

Student No.	PHA 243	PHA 244	PHA 245	OJT
1	B	A	A	A
2	A	A	A	A
3	A	A	A	A
4	A	A	A	A
5	A	A	A	A
6	A	A	A	B
7	B	A	A	B
Total	71.4% (A) 28.6%	100%	100%	85.7% (A) 14.3%

This table also shows the consistency between the grades of the same student in the 4 courses

Table No. 2: Students OJT Grades before (batches of 1993, 1994, 2000) and after (2001) batch change

Letter Grade Obtained	Before				After
	OJT 1993	OJT 1994	OJT 2000	Average %	OJT 2001
A	28.6	36.4	42.9	35.96	85.7
B	57.4	63.6	28.6	49.86	14.3
C	14.3	0	28.6	21.45	0

Only 35.96% (28.6% - 42.9%) of students obtained "A" grades in the OJT before introducing the change; while after the change was implemented, the percentage of students who obtained "A" grades increased to 85.7%.

After introducing the change, the overall results showed an improvement in the experiential OJT course (PHA 250) with 85.7% students getting grade "A". These grades correlate with the grades in the practical courses, which reflect consistency, improvement and absence of the contradiction that was encountered before introducing the change.

Recommendations for Continued Improvement

As a result of this project I am recommending the following to the Academic Council of CHS:

1. To include a section on time management, stress handling, communication skills, problem solving skills in the related courses of the curriculum, e.g., SBS courses.
2. To change the name of the course from Pharmacy field practice "OJT" to "Externship" since this name is a reflection of the proper definition of the course.
3. Externship is conducted outside the classroom. It is a component of the pharmacy curriculum under the overall direction and controls the College for which academic credit is granted to externs (students). It is a program where the student is evaluated by the preceptor and school. The primary objective of the externship programs is to ensure that students develop technical skills and competencies necessary for entry into their work.
4. All CHS programs must perform formative and summative evaluation of students during the experiential OJT to provide feedback to students on their performance in an environment in which they will eventually be expected to perform.
5. Encourage inter and intradepartmental collaboration and exchange of information and experience, especially in this aspect of training and evaluation.

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Reduce The Number Of Nursing Faculty In Post-Basic Nursing Programs

Introduction

The Nursing Division at the College of Health Sciences (CHS) provides a diverse range of nursing programs at basic and post-basic levels to meet the health service needs in Bahrain and the Gulf Cooperative Countries (GCC). It offers a 3-year program in General Nursing at basic level (Associate Degree) that graduates about 90-100 registered nurses annually. Also, 1-year specialized nursing programs at post-basic level, i.e. Nursing Midwifery, Psychiatric Nursing, Community Health Nursing, Critical (Cardiac Care), etc. that graduate 6-10 students annually and a 2-year Bachelor of Sciences program graduates about 18-20 students are offered for Associate Degree program graduates.

The nursing faculty consists of 41 faculty with one Chairperson and are divided among the different programs as follows:

Program	No. of Faculty	No. of Students	Faculty-Student Ratio
General Nursing (3yrs.)	**25**	**276-300**	**1 : 11/12**
BSc. Nursing (2yrs.)	**2**	**36-38**	**1 : 18/19**
Post Basic (1yr.)	**14**		
• **Psychiatric**	**3**	**5-8**	**1 : 1.6-2.6**
• **Community**	**4**	**5-6**	**1 : 1.2-1.5**
• **Midwifery**	**4**	**8-10**	**1 : 2-2.5**
• **Critical (Cardiac Care)**	**3**	**8**	**1 : 1.6**

This shows an unequal distribution of faculty between the programs and created frustration and dissatisfaction among the faculty in the General and BSc. Nursing Programs as they compare themselves with the post-basic program., not to say a waste of resources and inefficient utilization of manpower which is not cost-effective. The pressure of the BSc. and General Nursing faculty felt could hinder their ability to teach effectively, especially in clinical teaching.

Only 2 full time nursing faculty (in addition to non-nursing faculty teaching non-nursing courses) are needed to teach a post-basic program consisting of 6-10 students, whereas there are 3-5 nursing faculty employed at present to teach each post-basic program. The goal of this project is to reduce this number from 3-5 to 2-3 for each post-basic program by December 2001 (Academic year 2001).

Root Cause Analysis

The team, consisting of 8 members (7 female, 1 male) and identified based on Belbin's team roles, was selected from the Nursing Division with an age range of 28-50 years and teaching experience of 2-24 years. Six members hold BSc. in Nursing, out of which four also hold post-basic diploma in their specialized program, and two had MSc. in Nursing.

The problem was analyzed using the Fishbone and Pareto models. A variety of methods were used to investigate the problem which included:

1. **Review of literature, policy and standards:** Each nursing faculty is responsible for classroom and clinical teaching, course preparation, committee work, student's evaluation, counseling/advising students and administrative duties according to CHS job descriptions (see table). Each post-basic program has Head of program and 2-3 faculty, where each faculty has to teach 12 hrs. (contact) per week and the Head of the program 10 hrs. per week. So the total teaching hours per semester (16 weeks) should be 192 hrs. for faculty and 120 hrs. for Heads of programs. Classroom teaching (1810 hours) in the programs is implemented by full time Nursing faculty and part time faculty (guest speakers), and clinical teaching (2430 hours) is implemented by full time Nursing faculty and nursing personnel at the service (practice).

According to the job description, faculty in post-basic programs should have 476 hours of student teaching (classroom/clinical) for the whole academic year (3 semesters/40 weeks). If we leave aside the part time faculty and divide 1810 teaching hours by 14 full time faculty, each faculty will have 129 hours for the whole year and divide 2430 hours of clinical teaching without the nurses in clinical areas, each faculty will have 174 hours - a total of 303 hours for the whole year. This shows that each faculty has 173 hours less than the expected standard (476 hours) or 14-15 weeks free without teaching. If the hours that part time faculty and nurses in clinical areas are added, the number of free weeks of teaching for each faculty will increase!

2. **Semi-structured interviews:** These were conducted with the Heads of post-basic programs and focused on 2 areas.
    a. Their perception about the actual number of full time faculty required to teach each course. The data from these interviews showed that the number of full time faculty for any post-basic program should not exceed 2, even if the number of enrolled students reached 12 (which has never happened in any post-basic program).
    b. The procedure for allocating faculty to post-basic programs. Most said that 'it was the same for many years and maybe when a faculty went for higher studies another was recruited as replacement!'

    Another interview was conducted with the Head of the staff/faculty recruitment section of the Ministry of Health (MOH), which revealed that there were no policies or standards at MOH or CHS on the number of faculty required. The procedure implemented depends on the Nursing Division Administration's views, which was automatically forwarded to MOH. MOH officials are mainly concerned with the total number of faculty in the Nursing Division and the distribution of faculty was the responsibility of the Chairperson of the Division. So if the Chairperson is not knowledgeable about each course, how can the number of faculty required be known?
3. Questionnaire: A form was distributed among all nursing faculty to identify non-teaching activities and the time spent on each. The result revealed that the same amount of time was spent on these activities by post-basic faculty and BSc. and General Nursing faculty. However, some post-basic faculty spent less time on these activities than other faculty in BSc. and General Nursing programs.

All the data indicated that there were 14 faculty in post-basic nursing programs where there should be 8 faculty. It was obvious that these causes were all related to the system and people categories.

Alternative Solution

In order to reduce the number of faculty, there was a need to tackle some causes immediately (short term solution) and other causes later (long-term solutions) as follows:

1. Post-basic programs: Shift 1-2 faculty from each post-basic program to General and BSc. nursing programs for the current academic year, conduct workshops for all heads of programs on "Control in Management", and the Chairperson should reinforce job descriptions (standards) for heads and faculty of post-basic programs.
2. Nursing Division: Formulate a committee to design a system for allocating faculty to each program in the Nursing Division, the chairperson along with the heads of programs should work on designing a control system for the Division and a task force committee should be formed to work on strategy for replacing faculty on study leave without recruiting new faculty.
3. College of Health Sciences: A copy of the breakdown of teaching hours for each post-basic program in ratio to faculty number should be available in the Chairperson and Dean's offices and a committee should be formed in CHS to design a system for recruiting faculty to standardize a mechanism for control.
4. Ministry of Health: A committee should be formed in MOH with at least 2 CHS members to establish policies/standards for CHS full time faculty.

Implementation

Solution one was selected as it had a major role in solving the problem and was discussed with the Chairperson who shifted 4 faculty to the General and BSc. programs: 2 from the Community Nursing, 1 from Midwifery and 1 from Critical Care Nursing Programs (2 were assigned to BSc. and 2 to General Nursing programs). This reduced the teaching load on General and BSc. program faculty, reduced internal tension in the Division and the faculty/student ratio was reduced. Formal rules and regulations were needed to standardize the number of faculty in post-basic programs, and this change was reinforced again by standardizing the post-basic programs with the number of faculty during semester one (Sep. - Dec. 2001) leaving 2-3 faculty in Midwifery, 2 in Community, 2 in Critical Care and 2 in Psychiatric Nursing programs.

The driving forces of confidence, open-mindedness, cooperation and the level of understanding of the new Chairperson played a positive role in implementing this solution. However, it would have been better if more than one solution was implemented, but it was not possible due to the time limitation of this project.

Recommendation

To assist in improving the quality of Nursing Education at CHS, it is proposed that additional research is needed to examine the relationship of the variables identified to the proportion of part time faculty in nursing programs. This study could be implemented in all other CHS Divisions/Programs (English Department, Social and Behavioral Sciences, etc.) for better utilization of faculty and reducing costs. All Post-Basic program curriculum need to be evaluated by taskforce committees. Reduce the number of Head positions in Post-Basic programs (combine at least 2 programs under 1 Head) as number of students are limited. This will enhance better utilization of faculty and be more cost-effective as these programs are based on the needs of MOH and have only 1 head position (G-7) as Head for Critical Care Programs as there is only 1 Critical Care program every year. Faculty from General and BSc Nursing programs should have some Nursing Specialization (Midwifery,

Community, Critical, etc.), so the teaching needs of post-basic programs can be met by these faculty whenever necessary rather than recruiting new faculty (faculty can attend these specialization programs at CHS itself). Committees should be formulated to help design control system allocating faculty for each Nursing program, to develop strategy of faculty replacement during study leave without new recruitment and to establish policies/standards for CHS faculty at MOH level.

Results

The implemented solution benefited faculty in the General and BSc Nursing Programs by reducing the number of students assigned to each faculty by reassigning faculty from the Post-Basic programs as illustrated in the table below:

Post-Basic Program	Faculty before Implementation	Faculty after Implementation
Nurse Midwifery	4	2-3
Community Health Nursing	4	2
Critical (Cardiac Care)	3	2
Psychiatric Nursing*	3	2
Total	**14**	**9**

*** This program had 3 faculty; one went for higher study and the other two were moved to General Nursing Program as this program has been cancelled for the academic year starting Sep. 2001.**

Conclusion

This project's findings were that there were extra Nursing Faculty in the Post-Basic Nursing Programs, which indicated that the Nursing Faculty were not utilized properly. Money was wasted when compared to the services provided by these faculty. Control systems at the CHS were not effectively implemented, and there was no plan for faculty recruitment/utilization. This project succeeded in reassigning faculty from the Post-Basic Nursing Programs to the other nursing programs that were under-staffed.

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Bahrainization Plan for the Hematology Section

Introduction

A total of 160 Lab Technicians (LT) and Medical Technologists (MT) are employed in Health Centers (HC), Salmaniya Medical Complex (SMC), Public Health (PH) and Maternity Hospitals (MH) of the Ministry of Health. There are 16 expatriate staff in Salmaniya Medical Complex and 2 in the Maternity Hospitals (11%). Since one of the strategies of the Ministry of Health is Bahrainization at all levels of the Ministry, I am proposing the following plan to carry out this strategy.

Goal

Replace 5 expatriate Lab Technicians and Technologists working in the Hematology section with Bahrainis within the coming four years (1996 - 2000).

Supporting Data

- All LT's and MT's working in the Health Centers and Public Health Laboratories are Bahraini, but a manpower study conducted in SMC Laboratory revealed that:
  - There were 7 Non-Bahraini MT's (8 Bahraini) and 14 Non-Bahraini LT's (46 Bahraini).
  - The cost of employing a Non-Bahraini is more due to airfare and accommodation allowances.
- In order to implement Bahrainization, two types of training are needed; Managerial (for supervisory positions) and Technical. This can be achieved either through formal training (workshops, courses, etc.) or informal (counter part to the employee being replaced).
- The requirements for the position of a Medical Technologist is at least a B.Sc. Degree and one year experience.
- The requirements for the position of a Laboratory Technician is at least a Diploma in Medical Technology and 5 years experience.
- The Senior MT carries out different supervisory/managerial tasks in addition to lab tests and procedures.
- 5-6 Lab Technicians graduate annually from the CHS.

Tactical Plan

Manpower Distribution in the Hematology Section

Catagories	Bahraini	Non-Bahraini	Total
Sr. MT	-	*1*	**1**
MT	*1*	-	**1**
Sr. Lt	*2*	*2*	**4**
LT	*10*	*2*	**12**

Based on the above data, Bahrainization of the following positions is proposed:

1. One Medical Technologist

- Selected candidate should have above-average evaluation in working standard, be highly motivated, score 500 or more in TOEFL exam, complete pre-B.Sc. courses at the CHS, be accepted by a well-known university to

obtain a B.Sc. degree in Medical Technology (starting 1995) and replace Non-Bahraini Medical Technologist by September 1997.

2. One Senior Medical Technologist

- Selected candidate should have above-average evaluation in working standard, be highly motivated and have five years post qualification experience to work as counterpart to Non-Bahraini Senior Medical Technologist for six months (January - May 1997).

3. Three Senior Laboratory Technicians

- Selected candidates should have above-average evaluation in working standard, be highly motivated and have five years post qualification experience to work as counterpart to Non-Bahraini Senior Laboratory Technicians for a period of six months each (Sep. 1995 - Feb. 1996, Mar. 1996 - Aug 1996, Sep. 1996 - Feb. 1997).

4. Two Laboratory Technicians

- Selected candidates should have above-average evaluation in working standard, be highly motivated, completed Laboratory Aid course at the CHS and take replacement exam at the CHS to get Associate Degrees- first candidate in Oct. 1996 - Aug. 1998 and second candidate in Oct. 1997 - Aug. 1999.

5. Fill Three vacant Laboratory Technicians' Positions

- These positions will be filled by new graduates from the Lab Technician program at the CHS.

The following departments of the Ministry of Health need to be actively involved in implementing this plan:

- Directorate of Laboratory Services: to develop selection criteria and monitor and evaluate performance of the candidates.
- Directorate of Training: to organize the budget and make arrangements for course/workshops to train/develop selected candidates.
- The CHS: to expand/conduct various Laboratory exams and preparatory courses to train staff .
- Personnel Department: for placement/recruitment procedures.

Monitoring and Review Plan

Once the Bahrainization plan has been approved, the Laboratory In-service Continuing Education Coordinator will monitor and follow-up the training in collaboration with the concerned parties; meetings will be held to chart the progress and assess any obstacles. A progress report will be prepared and circulated to concerned parties in the Laboratory Services and Directorate of Training at the end of each year; and the Coordinator will need to be informed in writing of any changes in the plan.

Ms. Samira Al-Alaiwat
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Ministry of Health

Improve the Recruitment Process of Graduate Nurses

Introduction

The MOH Directorate of Personnel, established in 1981, provides human resources management services to around 6,800 employees of the Ministry of Health. Sixty percent (of which 32% are nursing staff) provide secondary health care, 20% provide public and primary and 20% provide education and administrative support services. Services are provided through 4 major sections that are supervised by mid-level managers: Manpower Planning and Control; Recruitment and Placement; Employees Benefits and Payroll; and Employee Relations.

The Directorate coordinates most of the services provided with the Civil Service Bureau (CSB), which acts as the central authorizing body for human resources for the whole government. Although CSB still continues to maintain many services, there has been a gradual realization in CSB to delegate some level of authority to the ministries.

Problem Statement

As the number of employees increased in the Ministry of Health, personnel units have been established to coordinate between various departments and the directorate and to improve efficiency, economic use of resources and provide relief for medical and nursing staff from administrative matters. Unfortunately, this has resulted in extra levels of administrative channels, delay and duplication of staff. It would be difficult to measure and achieve improvement due to the wide scope of the problem, so the team decided to concentrate on the procedure for recruiting fresh graduates from the College of Health Sciences (CHS).

The old procedure was very lengthy, involving 19 processes and took around 107 working days to finish. This was also complicated by duplication of services and created unnecessary workload on employees. The cost involved was high, and it was found that improving the procedure could result in an annual saving of BD12,750/-. All nursing officers involved in the review of the old procedure expressed dissatisfaction with the process.

Root Cause Analysis

Using brainstorming techniques, the team identified several problems areas that are listed below:

1. Tendency to centralize the decision-making process.
2. Current system, policies and procedures.
3. Unawareness among top management of the difficulties being faced.
4. Low competency of some employees from both service providers and customers.

Alternative Solutions and Implementation

Using brainstorming, discussions and flowchart analysis, it was decided to redesign the existing recruitment procedure. This cut the processes involved from 19 to 15 steps and reduced the total working days from 107 to 61 days only, which included for the first time an orientation meeting for fresh graduates. Almost all the steps were designed to be implemented right from the start of on-the-job training so that they should have completed most of the training, and employment should not take more than one week after their graduation.

The Kurt Lewin model was used to facilitate the change, and all the concerned departments were involved in the Continuous Improvement Wheel. This helped develop ownership to the proposed change by everybody. Materials for the orientation meeting were prepared with careful attention and contribution from all concerned parties. Support was obtained from DP, CHS Dean and Nursing Administration; and all personnel involved in implementation were trained and familiarized with the new procedure.

Conclusion

Analysis of the force-field diagram showed that the forces for change are more powerful than forces for maintaining the status quo. Attempts have been made to remove or weaken restraining forces and then strengthen driving forces. The three phases of Lewin model (unfreeze, change and refreeze) were used to manage the change.

The main elements of quality management were adopted to carry out this project:

- Teamwork
- Improve customer satisfaction
- Data driven

The result was that problems with the old procedure were resolved, and this was reflected in increased customer satisfaction with the new procedure.

Sayed-Najeeb Sharaf
Ag. Director of Personnel
Ministry of Health

Shortening the Length of Hospital Stay of Normal Term Newborn Babies by Applying a Multi-Disciplinary Plan

Opportunity for Improvement

Our duty in the BDF Hospital is to provide excellent and comprehensive quality health care services, while ensuring efficiency and proper utilization of available facilities. In 1999, there were 1,906 normal term new born babies delivered via normal vaginal delivery. The international standard from literature review and the current practice in regional hospitals and countries like Saudi Arabia showed that maximum stay for normal newborn babies ranges from 12 to 36 hours. Clinical Pathway is a comprehensive multidisciplinary plan to coordinate, treat and monitor care for a patient population with a specific disease. It is a simple concept that enables a clinical team to manage and audit its care for the patient. This approach is an opportunity to improve our services, shorten the length of stay, and thus, achieve better customer satisfaction.

Root Cause Analysis

Through brainstorming, we analyzed the causes that lead to both extended length of stay and customer dissatisfaction. The problem of extra-length of stay of normal term new born baby compared to the international standard was presented.
No coordination between staff, no guidelines for length of stay, delayed Lab results of the baby, delay in examination due to lack of communication and shortage of staff, the condition of the mother and the type of their stay lead to extended length of hospital stay. Thirty percent of healthy term newborn babies stay in Hospital for more than 48 hours.

Pediatricians and nurses do not visit regularly; babies results are not told to mothers, no proper policies and standards with regard to length of stay after delivery. Air conditioners are not working, noise, cleanliness; and there was no proper education on the best way to care for their babies.
Moreover the survey showed that 68% of our customers are not satisfied with the current practice.

Alternative Solutions

We agreed to concentrate first on decreasing the length of stay. If coordination between different departments caring for the normal newborn babies are optimized and standards for the maximum time of initial and discharge examinations as per internationally accepted standards are determined, then we will be able to resolve about 86% of the causes contributing to unnecessary extended length of stay in our hospital.

The aim of the team is to **"Develop, implement and monitor a Clinical Pathway for the full-term, normally delivered babies within one year".**

Implementation

We started unfreezing the current practice by campaigning for the Clinical Pathways. Lectures explaining the meaning of clinical pathways and the benefits it offers if implemented were designed and delivered to the concerned physicians,

nurses and clerks. After two months of discussions and several modifications of both the standing orders and the pathway specifics, the team agreed and produced the drafts for the clinical pathway and the standing orders. A target date of piloting the pathway was set for October 14, 2000. During the first two weeks of October the team visited the nursery, the labor and the postpartum wards and started preparing the staff for the piloting phase. The team decided to evaluate the project monthly during this phase.

Result

In 1999, there were 1,906 normal term newborn babies delivered via normal vaginal delivery, and 30% of these healthy term newborns stayed in hospital for more than 48 hours, costing BD76 per day. Therefore, the cost of each extra day these patients stay will be BD43,456.8 per year, which we can utilize for better quality of service. If the length of stay was shortened from 3 days to 2 days, we will be able to save BD43,456.8 per year. During the first month of piloting our project there were 220 total deliveries; 172 of them were vaginal deliveries. Only 100 babies were placed on the clinical pathway, which represent 59% compliance rate. Out of the 100 only 86 babies passed the clinical pathway and 16 failed. The main reason that our compliance rate is low was because babies were not placed on the Clinical Pathway.

Recommendations

To continue improvement we need to consider the other causes contributing to both the extended length of stay and customer satisfaction. More time is needed to investigate these problems to find other ways of improvement. Our next movements are summarized below.

1. To survey mothers again and compare results before and after clinical pathway implementation.
2. To survey doctors, nurses and others concerned for their acceptance of the clinical pathway and the difficulties in applying it.
3. Create incentives for those who work on developing the clinical pathways to keep their spirit up (e.g. team of the month).
4. Strive for better compliance.
5. Continue collecting data and analyze the variances.
6. Invite experts from neighboring countries where clinical pathways were successfully applied to help evaluate our work.

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BDF Hospital
State of Bahrain

Improving the Attendance of Trained Practical Nurses in Psychiatric Hospital to the Nursing Continuing Education Programs

Introduction

Trained Practical Nurses are the right hand of Staff Nurses, especially in Psychiatric Hospitals. They play an important role in the care of Psychiatric patients and in the implementation of many nursing procedures. So developing these categories of staff is very essential in improving the quality of care given to psychiatric patients.

Although they had certificates in trained practical nursing, continuing training is very important, especially since most of them graduated more than ten years ago. Although there are some educational programs for them, their participation and attendance is very poor. In this project, we are going to search for the causes of poor attendance of training practical nurses (TPNs) in the Psychiatric Hospital to the Nursing in the Nursing Continuing Education Unit. After identifying the causes, we are going to plan the strategy to implement how to improve the attendance.

Problem Statement

Nursing Officers complained that they are facing difficulties in making TPNs attend the activities of the Nursing Continuing Education. Although they have requested them to attend, at the time of the activities only a few TPNs attend without phoning them repeatedly. Ward Supervisors explained that in the annual appraisal, they noticed that the attendance is very poor in the Continuing Education attendance book, which for them, means that they are not paying attention to develop themselves by updating their knowledge and improving their skills. It is clear that failure in updating nursing knowledge will have a bad effect, not only in communicating with patients, but also with other categories of nurses and staff.

Mission Statement

To improve the participation of Trained Practical Nurses to 90% by the year 2000.

The Team Members

Our team consists of seven members who were chosen with the help of the Acting Senior Nursing Officer of Psychiatric Hospital. We felt that they can play an important role in improving the situation and in the implementation of the project, Each one of them had a different role to play, according to "Belbin's Team Roles".

Root Cause Analysis

In order to know the reasons for poor attendance in the In-service Education Programs, we planned to meet weekly to discuss the steps we can follow to recognize the main causes and decided to prepare a questionnaire in Arabic, since all TPNs are Bahrainis.

A sample consisted of 20 TPNs; 7 of them did not respond. Of the 13 who responded, 9 were male and 4 female. All the participants were qualified with a Diploma in Trained Practical Nursing. Their experiences ranged from 10 - 40 years and were from different settings in the Psychiatric Hospital.

Twelve participants responded that Nursing Continuing Education is useful for them, as it increases their knowledge and skills. One of them added that it exposes them to new issues in the field of nursing care, and only one participant responded

that it was not useful as she knew the subject/activities given to her.
Participants mentioned that the reasons for not attending regularly was due to:

- Lack of motivation
- Difficulty in attending due to other commitments/shift duty
- Unsuitable timing of the lectures
- Familial and social engagements
- Uninteresting lectures/subjects.

Results of the questionnaire showed that the majority had negative attitudes, underestimating the TPNs role, as well as a lack of motivation.

Alternative Solutions

From the root cause analysis and further group discussion, we agreed on the following possible solutions:

1. To prepare specific training need assessment for TPNs who work in the Psychiatric Hospital, and to plan specific courses and workshops.
2. Involve Nursing Officers and Nurse Supervisors in the presentations at some workshops and give them a feeling of importance
3. Discuss with Nursing Administration the possibility of providing some motivational incentives for those who are regular in attendance and participation of the nursing training activities such as letters of thanks, quality steps, etc.
4. To ask Ward Supervisors to stress the usage of the Nursing Continuing Education Attendance book during the TPNs appraisal, to evaluate their self-development like the staff nurses.
5. To encourage the attendance of staff nurses at the TPNs Journal Club presentation and vice versa.
6. Increase the responsibilities of the TPNs in the care of patients such as helping in administering medication, writing reports, and other nursing procedures.

Out of the above alternative solutions, the team selected the following to implement as the best solutions:

1. Preparation of a specific needs assessment for the TPNs:
   <u>Goal</u>: To identify the main training activities which satisfy their needs for the year 2000.
2. Involvement of Nursing Administration or some experts in the implementation of educational activities.
   <u>Goal</u>: To increase the interest of the TPNs to attend the In-service education activities by 90% for the year 2000.
3. Providing motivational approaches, such as letters of thanks, certificates of the best, regular attendance and quality steps (if possible).
   <u>Goal</u>: To increase the desire of the TPNs to attend regularly.
4. Stressing on maintaining the Nursing Continuing Education Attendance personal book.
   <u>Goal</u>: To increase the feeling of responsibility to develop themselves by the year 2000.
5. Encourage the attendance of the staff nurses for the TPNs Journal Club.
   <u>Goal</u>: To increase the TPNs' self-confidence and self-esteem to 70% by the year 2000.

Implementation

The implementation of **Goal No. 1** began in June 1999. Each member of the team worked on designing a sample questionnaire to use in assessing the training needs

of TPNs. After three meetings, we designed the final questionnaire. From the questionnaire we identified the main causes for the problem. I discussed the results with the Acting Senior Nursing Officer of the Psychiatric Hospital, and she agreed to work on providing some motivational approaches such as letters of thanks, some incentives, if possible, and changing the duties of TPNs who are supposed to attend a workshop by putting them on suitable shift duty.

To implement **Goal No. 1** we decided to design another questionnaire for the TPNs to state the different topics and subjects that they needed to be skillful in. In September 1999, we sent the list to them and requested ward supervisors to ask them to state all the general and psychiatric topics, which they required. All responded to the request, and the list was designed with the needed topics. After reviewing all the topics with the Nursing Administration, we arrived at the main and important subjects. The final list was designed and shown to the Nursing Administration and was approved.

Implementation of **Goal No. 2** began in October 1999, and I discussed the list of topics with the people concerned to implement some courses and workshops. It was agreed to asign different months of the year 2000 (e.g. English courses, customer services workshop, first-aid workshop, etc.)

Implementation of **Goal No. 3, 4, and 5** started in December 1999. TPNs were encouraged to regularly attend the staff nurses Journal Club. Ward supervisors requested that all TPNs provide the Nursing Continuing Education Attendance personal book during the time of the annual appraisal. They explained to them the need to meet the desired standard of educational activities attendance by the year 2000. All the educational activities are put on the educational plan of the nursing staff of the Psychiatric Hospital for the year 2000.

Recommendation

- In order to encourage the TPNs to attend educational activities, I recommend that the Nursing Administration work on the compensation of time spent in the courses or workshops if they come from home for more than 2 hours.
- To request the nursing administration to involve TPNs while doing the TNA for the next few years.
- To increase the usage of positive reinforcement for the TPNs to attend the training activities, in relation to the usage of the disciplinary actions.
- Stress on increasing the responsibilities of the TPNs; and it should be included in the official job description, as this will increase their self-esteem.
- Recommend general courses and general workshops for all TPNs in the Ministry of Health and not only in the Psychiatric Hospital.
- To make one combined TPNs Journal Club for all TPNs in the Ministry of Health because the total number is not too high, as it will help in the exchange of information and experiences between them.

Ms. Waheeda Daboos
Coordinator, Nursing Continuing Education - Psychiatric
Directorate of Training

Nomination Process for Incentive Awards and CSB Form (10)

Introduction

The Purpose Statement of The Directorate of Personnel (DP) in the Ministry of Health is to support the delivery of health care services by providing human resource management services effectively and efficiently. Directorate of Personnel, in compliance with the desire to improve the services, has to consolidate its role by developing human resources strategy focusing on the role of individuals in accomplishing that goal. DP is responsible for processing all types of personnel routine transaction provided to all departments/Directorates in the Ministry, which contribute indirectly to the services provided to the citizens and residents. Incentive programs, if implemented for various categories of employee will guarantee job satisfaction and high moral. This will affect directly on the quality of services provided to customers.

Poor quality of management and lack of motivation and job satisfaction is the problem this paper addresses. It suggests the use of Incentive Awards Program to motivate the employees to utilize their abilities and knowledge to the highest possible level in order to accomplish the goals of their department. Also, this paper proposes replacing the incentive award Form No. 10 with a new form.

Problem Statement

It is expected that Employee Relation Section of DP maintain a good relationship between the employee and its directorate to encourage the employee to do their job well. Continuous Improvement of the Quality of services can be achieved mainly through qualified, capable and trained employees. In order to accomplish this goal, the majority of the workforce at the Ministry of Health should exceed the expected level of their performance with highest level of motivation and job satisfaction. This can be possible if we effectively use the current Incentive Awards Program by focusing on the objectives of the program rather than doing a routine action of processing financial rewards. In such a huge Ministry of which the assigned workforce exceeds 6,600, it is obvious that this figure gives an indication of the number of incentive awards action processed each month within the scope of the CSB regulation No. 430.

There are three types of awards that can be granted to the nominated eligible employees, which are:

- Quality Step Increment - This award is given only when the overall performance is outstanding (We are focusing on this)
- Special Act Award
- Letter of Appreciation

The regulation allocates a maximum of 4% Quality Step Increment (QSI) as incentive awards for the whole year, for the total workforce of the concerned Ministry. This limitation caused dissatisfaction to some outstanding employees who are eligible for the awards. A circular on Promotion of MOH Staff dated 29th of September issued by H.E The Undersecretary stated that: "It was felt necessary to review the process of recommending promotions in all categories of staff in order to ensure that all employees are given equal opportunities for their career progression. This could be achieved by establishing internal committees within the concerned

Departments/Directorates to review the promotions of their employees. The promotions recommended by such Committees could then be forwarded to Directorate of Personnel after the concurrence of the concerned Director. This should be also implemented on nominations of QSI.

Several documents are required for processing each nomination, which is always causing delay in forwarding to Civil Service Bureau. Those papers are as follow:

- A copy of CSB Form No. (10)
- A copy of the Appraisal Form
- A copy of the Supplementary Form (Internal form used to define the history of the nominated employee regarding previous incentive awards)

Directorate of Personnel in many cases does not receive all the required forms together at the same time from the concerned directorate or department. Either the Appraisal Form is not received or sometimes the supplementary form. The procedure causes a waste of time, effort and additional expenses.

This problem can be solved by designing ONE Form only to process each action of incentive awards nomination without the need of the other two papers to be attached.

Root Cause Analyses

The team used brainstorming technique to identify the problem, which can be classified as follows:

1. **Regarding the nomination process:**
   Each nomination should not exceed 3 to 4 in large departments (such as SMC) without considering the total number of eligible employees. In most departments, supervisors send their nominations of QSI to DP without considering the 4%. In some cases, nominations are based on the good relationships between the employee and his/her direct supervisor or other officials regardless of the employee's performance that justifies the nomination and vice versa. Supervisors in most directorates do not encourage their employees to bring new ideas that will have significant impact on their department. If this is done, it means using other types of incentive (Special Act Award) rather than focusing on QSI only.
2. **Regarding Form No. (10)**
   HE The Undersecretary instructions to review the process of recommending promotions or recommending QSI Awards also requires establishing internal committees within the concerned Department/Directorates to review the nominations of their employees. This has to be included in Form No. (10) which means the nomination has been concurred by the Internal Committee. Overall Performance Rating is considered to process Performance Appraisal but the process is long and time consuming. The information regarding the Supplementary Form is all about Date of previous Awards. This can be also included in Form No. (10).

Possible Solution

Using brainstorming and dialogue with the concerned persons, it was decided to redesign Form No. (10) with the objective of solving the problem of assuring the ideal distribution of the 4% of the QSI Award.

After several meetings, the team suggested the possible solutions as follows:

a) Review the current nomination process of the Incentive Awards.
b) The necessity to be committed to HE the undersecretary's instructions regarding the process of selection especially regarding the Internal Committee in each

Department/Directorate.

c) The 4% of QSI should be fairly distributed among the most eligible employees.
d) Reviewing Form No. (10) and the required changes and adjustments to be done.
e) Encourage top management support to achieve the aim.
f) The team agreed on starting working on the New Form.

The team leader considered all suggestions in order to prepare the final copy of the new form.

Implementation

A new Form has been proposed. The original Form designed by CSB (Appendix C) was in both languages: Arabic and English, but in fact it is filled either in Arabic or in English. The New Form is designed in Two Forms (one in Arabic and one in English) in order to make it clear and suitable. The Proposed Form will be submitted to CSB for their approval. Upon getting the CSB approval of the new Form, we will start implementing it immediately in all MOH Departments/Directorates.

Conclusion

The team met recently (in January 2002). As the leader of the team, the undersigned thanked them for their cooperation and patience.

The form is not yet implemented waiting for the CSB approval. If implemented, we expect it to solve a lot of problems; save a lot of time, money and effort. It will improve the efficiency of the Incentive Awards program, which will then improve job satisfaction and enhance employees' confidence.

Wahiba Marzooq
Civil Service Bureau

Improve Central Communication System

Introduction

The Communication Unit is an essential part of the General Services Department at Salmaniya Medical Complex; and the main objective of this unit is to provide an excellent telephone, radio and audio communication service to patients, staff, visitors and the public (as internal and external customers).

At the Ministry of Health, there are two main telephone exchanges (PABX) with 2000 extensions, 63 incoming (I/C) lines, 99 outgoing (O/G) lines, 8 telephone consoles and 550 pagers with group and individual features. The whole system covers the SMC complex, MOH headquarters block, Tylos and Awal buildings, Psychiatric Hospital, Public Health, Health Centers Directorate and Rufaidah Hostel. In addition there are a number of hot line facilities between SMC and 20 health centers on the Island for Emergency communication services during fire, crisis and disaster situations.

Problem Statement

The main complaints and problems at the Ministry of Health (MOH) Central Communication System were about delays in responding by radio and telephone operators. The duration between ringing and operators' response was about 50 seconds for each call, while the acceptable international standards duration for hospital communication services is not more than 30 seconds. This problem caused customers' dissatisfaction; especially during peak hours for at least the last six months.

To confirm the real situation/problem through statistics and written data, the local agent was requested to conduct a traffic study on a 24-hour basis for one week. The results revealed that it took 58 seconds for each call. Our main objective then was to reduce this to the acceptable standard of 28 seconds per call within a period of six months as a target.

Root Cause Analysis

We established a small team to conduct the root cause analysis for the gap between telephone ringing and operators' response. We used brain storming to identy the causes leading to customers' dissatisfaction that is listed as follows:

1) Staff are not using directory.
2) Staff are not using direct bleeping facility.
3) Lack of direct supervision.
4) Calls are not distributed equally.
5) Lack of keyboard skills.
6) Five old and slow consoles affects operator performance.
7) Public are not using DDI facility.
8) Lack of English language causes delays.
9) Other minor causes which contributed to increasing the problem.

Alternative Solutions

1) **Bleeping features:** Prepare and issue directory with clear instructions and indicating that operators will bleep group bleeps only.
2) **Information Center:** Direct all enquiry calls to SMC reception, provide receptionist with necessary information.
3) Replace the 5 old consoles with 4 new meridian consoles and repair faulty consoles.

4) Limitation for auto-attendance: Upgrade and expand features, provide additional answering machines to cover I/C calls, evaluate the upgraded system before purchase. Contract with equipment/system supplier (Batelco) to include training program for staff.
5) Appoint one senior operator for direct supervision only during peak hours.
6) Arrange for regular meetings with all supervisors, evaluate the quality of services provided by telephone operators and concentrate on their performance.
7) Initiate rewards and promotion plan for employees to motivate them.

Implementation

1) New telephone and bleep directory with utilization instructions were pub lished and distributed.
2) We stopped bleeping for individual pagers through operators.
3) One direct Supervisor was assigned in the Switchboard hall.
4) An ACD system for equal distribution of calls was installed.
5) All operators were sent for training in keyboard skills.
6) Some operators were sent for English language courses.
7) Five old consoles were replaced with new and advanced consoles.

Results

Three months after implementation, the project was evaluated by conducting another traffic study through Batelco. Results of a test run using a stop watch to measure the difference, we found that the call duration had reduced from 58 seconds to 44 seconds, while the results of a questionnaire to assess customer satisfaction after implementation revealed that customer satisfaction had improved from 36% to 68%.

Recommendations

Due to the shortage of time, budgetary limitations and priority basis, we could only complete phase one of the project and solve only 50% of the problem. However, SMC Administrators were very impressed with the actual results and output of the proposals.

Since our shared vision and goal is to provide excellent communication services, we will continue with the next phase in overcoming the balance of 14 seconds to reach international standards. We will continue to work as a team in monitoring and evaluating the project, making necessary changes when required, to achieve a higher percentage of customer satisfaction with the communication services.

Younis Ashoor
Superintendent General Services
Ministry of Health

Salmaniya Medical Complex
Service Efficiency

Reducing the Wastage of Film in the Radiology Department (REJECT ANALYSIS)

Problem Statement

Different studies, which were concerned with quality assurance in radiography estimated wastage of film as high as 20% in some departments. The Radiology Department has the highest running cost among other departments in the hospital; as it has the most expensive equipment, costly consumables, power consumption, etc.

X-ray films are the most expensive consumables of the x-ray department. The average size and type of film cost 1 BD, and the department is using about 900 BD worth of films everyday. A rejection rate of 7.52% amounts to an expense of BD 68 per day, which if avoided can be used for purchasing instruments or equipment. Following the ALARP rule (AS LOW AS RADIATION PRACTICABLE), which means the production of a diagnostic radiographic image with minimal exposure to radiations by avoiding repeated radiographs you can save time and provide better service, and reduce exposure to radiations.

Root Cause Analysis

To obtain the root cause analysis of the rejection rate in the Department of Radiology at Salmaniya Medical Complex, the team spent four weeks for the main study stage and two weeks for evaluation stage. The objective of the project was fully explained and clarified to the staff and all concerned persons. Each survey week started on Thursday morning and finished on Wednesday night. Before Thursday morning, all films in the department were identified, counted and details were recorded. A daily and weekly check was carried out to ensure the accuracy of the records. The repeated films were sorted into five different categories:

Over-exposed films, Under-exposed films, Positioning fault, Movement artifacts and Fogged films.

In our study we found that there are two main causes for rejection of films:

1. **Human error -** Radiographers do not have sufficient knowledge of basic radiography and radiation protection.
2. **Equipment error (x-ray units - processor) -** X-ray units sometimes have problems of over or under exposure. Film processors are old and are not regularly serviced.

Alternative Solution

Using Driving forces and Restraining forces, the following solutions were put forward.

- Radiographers should have continuous education and all forms of educational aids (i.e. books, posters etc) should also be provided.
- Senior radiographer should give appropriate supervision to the Junior staff
- Proper maintenance and quality assurance of all machinery including x-ray units and processors.

Implementation

The following measures were taken to implement the situation.

1. All the radiographers were supervised by Senior Technologist who is a member of the team.
2. Charts and posters were hung in the radiography room to assist the

radiographer in obtaining high quality films, and every week a chart showing the rejected film of the previous was created.

3. Lectures and tutorials were organized mainly for the junior radiographer.
4. Frequent preventive maintenance service of the x-ray units and film processor were undertaken.

To unfreeze the situation it was important to inform the staff concerned about the project and its benefits to the patient and the cost effectiveness. It was emphasized to the radiographer that the results of the project would not affect their job security.
To refreeze it was important to continue all the measures that were taken to reduce the percentage of rejected films.

Result

After the implementation of the suggested solutions, a decrease in overall rejection rate was noted as shown in the table below.

Rejection rate after the implementation: 6.88%
Rejection rate before the implementation: 7.52%

	No. of Films used	Repeated Films	Rejected Films	Total Rjected Films
Before Implementation	11,347	443	485	928
After Implementation	8,221	295	352	647

Recommendation for continued improvement

Appropriate persons, teamwork, right scheduling and longer period of time is required to have better results for future project. Continuous education for the radiographers should also be put into practice.

Dr. Abdulhameed Ali Al-Alwadhi
Consultant Radiologist
Salmaniya Medical Complex

Controlling the Pharmacy Budget Consumption in Psychiatric Hospital in 2001

Introduction

The Pharmacy Department in the Psychiatric Hospital provides services for in-patients, outpatients and community patients. In my capacity as Pharmacy-in-charge, I made it a point to check our performance periodically (sometimes on a daily basis), hoping to improve the customer (doctors and patients) satisfaction.

Problem Statement

There was no effective control system applied for the budget consumption of the Pharmacy which was increasing steadily as shown in the following table of drug consumption from June to December 2000:

Month	Cost in BD
June	29,169.384
July	12,103.345
August	13,631.054
September	18,649.157
October	28,013.191
November	16,738.948
December	17,590.567
Total	**135,895.645**

Objective

My assignment was to decrease the drug consumption budget in the Psychiatric Hospital Pharmacy for the second half of the year 2001 as compared to the second half of the year 2000.

Using Belbin's theory, members of the team were selected from different departments in the Psychiatric Hospital.

At its first meeting, I presented the team with details of the cost of drugs for the second half of the year 2000, and I explained to the team the importance of decreasing budget utilization by 15 - 25%, so that new and more effective drugs could be introduced, giving doctors a wider range of choice in their treatment. In subsequent meetings, members of the team actively participated with ideas and suggestions in analyzing the root causes of the problem and look for tools needed to achieve the objectives of the project.

Root Cause Analysis:

Using the Pareto and Fishbone analysis, the following problems were identified:

1) Bulk drug indent
2) Drugs dispensing system for out-patients on partial basis depended on one factor:
   i) On conducting a random study with doctors from different departments of the hospital, the team found that most doctors prescribed drugs with a fixed system, including the period given to the patient and the number

and quantity of drugs (depicted as 60% in the Pareto chart).

3) Drug dispensing system for in-patients: (estimated as 80% in the Pareto chart analysis) The Drug Unit dosage form/Drug Inpatient sheet were used in dispensing drugs to inpatients in seven short-stay wards only, while the old system of bulk indenting (drug indent book) was used in four long-stay wards. The advantages in using the drug unit dosage form were: (1) unit dose is controlled by the pharmacist, (2) no extra medicine is kept in the ward, and (3) prevents any chance of drug abuse by nursing staff.
4) Bulk system depended on the judgment of the ward supervisor, who is the only person to determine the quantity of drugs needed. This system was considered doubtful as the chances of miscalculation and abuse are high. The team found that about 20 - 25% of unused drugs were returned to the pharmacy on its expiry. The cooperation of nursing administration was crucial in dealing with this problem.
5) Use of new drugs in the field of psychopharmacology.
6) How Pharmacy Staff applied the pharmacy policy for dispensing drugs: A questionnaire was used to find out how staff applied the rule that drugs should not be given for over 12 weeks at a time and not more than 200 tablets in number. Results showed that 75 - 92% staff followed the rules.
7) Patients' (customer) satisfaction: A study was conducted among 100 patients to evaluate customer satisfaction and requirements concerning the quantity of drugs dispensed and instructions (dosage regimen, side-effects, packaging, etc.). An average of 62.75% expressed satisfaction with the overall service, 25.75% found it unsatisfactory, while 11.5% were undecided.

Alternative Solutions and Implementation

1) Inpatient dispensing system (80%)

The solution for this problem was to totally change the dispensing system in the four long-stay wards from the bulk system to the system of the Unit dosage form and was recommended and accepted by the Administration. Implementation will start from October 2001.

2) Doctors' habit (60%)

Meetings were held with four groups of doctors to explain the problem in the methods used in writing prescriptions, inviting their suggestions and encouraging joint responsibility. As a result, we started to implement new restrictions and a plan for controlling inappropriate prescribing methods.

i) Restrictions for writing prescriptions:
ii) Prescriptions for high cost drugs should be countersigned by the Firms' consultants.
iii) The period of the prescriptions should not exceed 10 weeks.
iv) The Pharmacist has the right to control the quantity and strength of drugs given to patients.
v) The above measures aimed at controlling the dispensing process is not only a first step but helped to draw the attention of the doctors to budgetary issues.

3) Outpatient drug dispensing system

Since the majority of patients desired the full prescription, efforts should be exerted to persuade them to accept partial prescription as supplementary. A study which was conducted through the use of a questionnaire with two groups showed that between 55 - 60% in both groups accepted the partial prescription supplementary.

Results and Improvement

A comparison study on the actual cost of drugs in BD between the 2nd half of the year 2000 (before implementation) showed a (total difference of 1.5%) decline in the 2nd half of 2002 (after implementation). Budget consumption declined in October 2001 by 28.75% and in November and December by 8.75%. This showed us that we are in the right direction and that teamwork created a very useful place in the success of this project. While the percentage of difference is not highly satisfactory, it did reach expectations because of the short period.

Recommendations for Continued Improvement

This project needs about two years for implementation to achieve effective results. I recommend that we continue with the changes that should be re-checked and evaluated periodically for continuous improvement.

Application of SWOT is very important in this project in which there are many points of strength, like our thinking as a working team, and weakness which is clear in some results dealing with patients, opportunities for continuing with each successful step and trust by talking about the results and our ability for implementation.

Adel Sarhan
Pharmacist
Psychiatric Hospital

Reducing Unnecessary Admissions of Febrile Convulsions

Introduction

The mission of the Pediatric Department is to provide high quality medical care that satisfies the needs of Pediatric patients in Bahrain. To achieve this mission the department provides organized medical services which include the following:

1. Inpatient services (admitted patients)
2. Outpatient services (Pediatric clinics)
3. Pediatric Emergency services (part of Accident and Emergency Service) run by pediatricians in the morning and by a pediatric team on call after morning hours. It serves as a gate for admitting Pediatric cases and to manage ambulatory Pediatric cases (those with less severe sicknesses who receive treatment and can be discharged to be followed up either in the local health center or in the Pediatric Clinic).

Febrile convulsion patients are admitted routinely in the hospital, usually through the emergency room as the condition occurs as an acute illness, necessitating emergency care. The condition is usually benign and the patient can be discharged home after the pediatrician's evaluation and necessary treatment.

Problem Statement

In alignment with the Ministry of Health trend for better utilization of available resources and based on available data, an opportunity of improvement was recognized "to reduce unnecessary admissions of febrile convulsions from 100% to 50%".

The main expense of medical care in the Pediatric Department is inpatient services. Data collected from annual reports from 1999 - 2001 showed that Pediatric admissions ranged between 5,082 and 5,276. From clinical observations of the data, it was obvious that many admissions of febrile convulsions were unnecessary and could have been managed safely as outpatients without comprising the standard of care. Routine admission of these cases is inappropriate and affects more than one party, as shown below:

1) Patients and their families:
   i) Disturbance of family life as one parent (mainly the mother) should stay with the child in the hospital.
   ii) Absence of the parent(s) from work
   iii) Being an inpatient carries the potential risk of hospital acquired infections by the child and his family

2) The Hospital/Ministry of Health Organization:
   i) Reducing admissions will have a positive impact on the hospital:
      (a) Better utilization of resources.
      (b) Any significant reduction in the number of admissions will definitely lead to significant saving in the high cost of inpatient services.
      (c) Doctors and nurses efforts will be spared and directed to patients who really need it.

Root Cause Analysis

Using Belbin's Team roles, I selected a hardworking group who were willing to participate in the project. I had the opportunity to coordinate the teamwork, clarify the goals and objectives to the team and to the Pediatric Senior and Junior Residents to have a "shared vision", creation and justifying the need for change. The team examined data from the annual report for the year 1999, studying the number of admissions of febrile convulsions, monthly and annual admissions, the length of stay (LOS) and the cost of hospitalization. Two members were assigned the responsibility of formulating guidelines to help junior and senior residents to admit or discharge patients when they come to the Pediatric Emergency Room, as well as follow up in the Pediatric Clinic. A fishbone analysis revealed the following reasons for the persistent problem of "routine admission of febrile convulsions":

Families

- Fear of going home with a child who had convulsions.
- Obeying doctors' orders to admit the child.
- Mother considered it better to admit the child as she had no time to look after the child at home, especially in large families.
- Previously admitted febrile convulsion patients' acceptance that they are usually admitted.

Pediatric Doctors

- Lack of time for proper evaluation and management at ER (required education of families).
- Busy emergency room, senior resident cannot see all the patients, so junior will admit.
- Feels secure/safer to admit.
- No consultant or chairperson support for change.

Hospital System

- Static policies, change takes time.
- Tendency of hospital administration to take reactive solutions when problems arise.
- Low level of staff awareness about expenses.
- Lack of Quality Control.
- Emergency doctors refer patients with a message for admission.
- SMC is the only secondary care hospital in Bahrain.

Health Center Doctors

- Routinely refer patients of febrile convulsions to ER.
- Inadequate knowledge of some primary health care doctors about the condition.
- Lack of time to educate families about the condition.

Alternative Solutions

Suggested solutions were limited in view of the nature of the project and the medical aspect of the indications for admission.

- A suggestion to create an observation room in the ER was considered unre alistic and difficult to achieve due to shortage of manpower and budgetary constraints.
- Another solution was to do important investigations in the ER and decide accordingly about admission. This suggestion was also difficult to implement due to overload of patients in the ER and the delay in getting laboratory

results which will create more chaos in the ER especially during peak hours.

- The ideal solution was considered as running a Pediatric Emergency Service by our department. This will provide a solution to this and other similar problems we were facing. However this solution also required more staff and expansion of the department in terms of manpower and budget. It was a good strategy and could be implemented within the next 5 years, as a Pediatric Emergency specialist is currently doing his postgraduate training and another candidate will soon be going for training.
- The team reached the conclusion that the best solution would be in managing the problem by using the same resources, taking the initiative for change by providing clear guidelines to those doctors who are facing the patients and their families.

Implementation

Unfreezing was started by explaining to all residents the need for change, and the advantages for all parities involved. This created a shared vision and clear goals. Data on admissions of febrile convulsion in the year 1999 was taken as a model to verify the number of patients, length of stay (LOS) in days for all patients and the average LOS for each patient and the cost of the admission.

Health records of 50 patients with febrile convulsions were reviewed to know the "routine" and the "special" investigations usually done for patients who are admitted and were then categorized into three sets according to the frequency.

Guidelines which were formulated by two team members for reducing unnecessary admissions, contained basic information about the condition, indications for admission, arrangements for follow-up for those who are discharged from the ER and will be seen in the Pediatric Clinic by one of the team on their clinic day or by a senior resident.

The chairperson's approval of the new policy was obtained and the sister-in-charge of the clinic was informed and asked to cooperate and facilitate easy access of these patients to be seen in the clinic.

The guidelines were printed and distributed to all junior and senior residents and placed on the notice board of the Pediatric Department, Pediatric Clinic and the Pediatric Emergency room. Feedback from junior and senior residents was obtained after implementation and found to be very supportive. The change was reinforced and the process went smoothly and is continuing (refreezing, according to Lewin).

Results

On comparing results after one month of implementation, we found that while there were 16 admissions in 1999-2000, there were only 6 admissions for the same period (one month) in 2001-2002. This means that there was a 62.5% reduction in admissions after implementation

Recommendations

1. The results of the project was impressive but was only for a short period after implementation. We are confident that the next six months of implementation will produce excellent results and more solid conclusions.
2. The project could be more successful if we took the feedback of the families (customers) affected by the change. This will be possible when we have a

larger number of patients; then the feedback will be more representative.

3. It will be more effective to consolidate the knowledge and education of families if we give them booklets or brochures about the condition. It will give them more confidence to deal with the illness at home after seeing them in the Pediatric Emergency Room.
4. Communicating by telephone with those who are discharged from the ER could have been arranged to know if any problems arise during the waiting period until they come to the Pediatric Clinic and if any help could be given by the team.

Dr. Ali Ebrahim Salman
Consultant Pediatrician, Pulmonologist
STRP Education Coordinator
Department of Pediatrics
Salmaniya Medical Complex
Ministry of Health

Improve the Quality of Services Provided by the Physiotherapy Department

Problem Statement

There is a growing demand for the services provided by the Physiotherapy Department at Salmaniya Medical Complex. Annual statistics reveal that the number of patients attending the Physiotherapy Department is second only to those seen at the Accident and Emergency Department at Salmaniya Medical Complex.

Increasing number of patients resulted in appointments being delayed and widened the gap between visits, thereby affecting the quality of treatment. Physiotherapists and technicians were assigned similar number of patients, thus limiting the time the therapist required to make a full patient assessment and follow-up. Shortage of space and equipment compounded the situation, resulting in dissatisfied patients, treating doctors, as well as administration officials.

Over the last few months several changes were initiated by the Ministry of Health to ease the overburdened services. Supported by increased manpower and equipment, two new physiotherapy units were opened at Ibn Sina Health Center in Manama and NBB Health Center in Arad to provide physiotherapy services to patients in those areas. The resulting easing of pressure on its services at Salmaniya Medical Center enabled the Department to develop a new system that gave more time for physiotherapists to do patient evaluation and treatment. Duties and responsibilities of physiotherapists and technicians are clearly defined and provides them with more flexibility in coping with patient lists and any emergency situation or staff absences. Despite the changes, there have still been complaints from doctors regarding the quality of services provided.

The purpose of this project is to find out whether these complaints have validity and, if so, what possible changes can be made to improve the quality of services.

Root Cause Analysis

A questionnaire was designed and distributed among 31 physiotherapists and 4 technicians working in SMC and the Health Centers where the real problems exist. 30 physiotherapists and 3 technicians responded, and it was found that the problem of low quality care was due to unclear and incomplete evaluation of patients and was directly attributed to the high number of patients seen everyday. Lack of communication and confusion over authority between physiotherapists and doctors also contributed to the problem. Complaints of high workloads of physiotherapists and technicians were due to lack of coordination and cooperation between staff. The physiotherapist's evaluation forms also need improvement to enable better follow-up of the patient's problems.

Solutions and Implementation

The study identified two factors:

1. External factors: Improve communication between physicians and therapists to minimize conflict regarding patients and reduce unnecessary referrals.
2. Internal factors: Improve cooperation and coordination between physio - therapists and technicians by updating job descriptions, encouraging on-the-job training and recruiting more technicians especially for the Health Centers.

The results of the study were discussed with administration and a letter was sent to concerned doctors, Chief of Staff of Health Centers, Chairman of Orthopedics, Chairman of Medical Section, Chief of Medical Staff in SMC and the CEO of SMC to discuss the problems and improve communication and cooperation.

Results and Recommendation

So far we have met with the Chief of Staff of Health Centers and his regional managers to analyze the problems we face regarding patient referrals from the Health Centers to the Physiotherapy Department and brainstormed alternative solutions to provide better quality intervention for patients. We agreed to provide statistical data of the problems for more analysis at our next meeting. We also met with the Chairman of the Pediatric Department of SMC and came up with an agreement for the whole issue.

The validity and outcome of this project was affected by the time limit. Although we followed Belben's rule for effective teams, this classification was done only after the team was formed because all participants volunteered for the job and came under one category (company workers). To improve team efficiency, the group has to come from different categories. Team members did not consider patient satisfaction in this study, which is the main issue in quality management and this issue must be addressed in any further studies.

Finally, because of the different specialties and different number of staff in the Physiotherapy Department, a separate study and comparison of each specialty is needed. This study could be used as a pilot study for future projects.

Mr. Ali Abdulla Ghanem
Chief of Physiotherapy
Salmaniya Medical Complex

Prolonged Appointment for Fracture Patients Referred from A&E Department to Fracture Clinic

Introduction

The new Accident and Emergency Department (A/E), opened in 1997 and located in the south block of Salmaniya Medical Complex, provides secondary and tertiary health care to around 500-700 patients who visit the department daily. The most common conditions are life-threatening such as severe head injuries, road traffic accidents (RTA), burns, myocardial infarctions, etc. The main problem is approximately 85% of patients with fractures referred by A/E to the fracture clinic are seen after 3 weeks and only 5-10% are seen within 2 weeks.

Problem Statement

While we would like the waiting period for all patients with fractures who are referred from A/E to the fracture clinic for appointments to be one week, about 75% must wait for 3 weeks or more, about 20% must wait 2 weeks and 5% must wait 1 week to be seen.

Main Objective

The main objective of this project is to reduce the waiting period for appointments in the fracture clinic from 85% to 40% within 3-4 months. Achieving this objective will result in reduced complaints, increased patient satisfaction and decreased post-fracture complications.

Root Cause Analysis

A working team was formed to fulfill the objective of this project based on their complimentary positions, skills and interests, using Belbin's team roles as the criteria. At first, I examined the data on the incidence rate of fracture cases in A/E and the referral of these cases to the fracture clinics for appointments for a period of one month (May 2001). A meeting was called with members of the team who were given this data, and I asked them to study the problems in their concerned areas and come up with solutions at the next meeting. At the second meeting, the list of causes was reviewed, and it was decided to use one tool (interview and observation) to gather all the necessary information about the problem.

A pilot study was conducted where 10 patients who attended A/E with fractures were randomly selected and interviewed by telephone to get their opinions of the appointment services in the fracture clinic. Seven were Bahraini, two Indian and one was Filipino, with six of them being males and four female in the age range of 6-45 years.

Six (60%) of the interviewees expressed their unhappiness with the appointment time they got, two (20%) could not wait for the appointment and decided to visit a private doctor and two (20%) felt that the appointment they got was okay.
The team met again to discuss the findings and identified the following causes:

- The delays in appointments are due to the increased numbers of fracture cases with no increase in the number of care providers.
- The number of Orthopedic Specialists is 4 since 1997, but the number of fracture cases and RTA is significantly higher.

- Increasing number of cases of back pain and other complaints has put more pressure on the Orthopedic clinic.
- Shortage of Senior Residents and Residents. There are 4 Consultants, 4 Chief Residents, 2 Senior Residents and 8 Residents in the Orthopedic Department.
- Only 3 rooms are available in the orthopedic clinic.
- The total number of working hours for the orthopedic clinic is 48 hours per week and a total number of 288 patients can be seen by the orthopedic physician if each patient was seen for a minimum of 10 minutes. However, the list has increased to about 480 patients to overcome the increased number of fracture cases leading to the working hours being increased from 4 to 6 hours per day and less time being spent for each patient (8 minutes).

Alternative Solutions

The team met again and discussed the following possible short and long term solutions that would help overcome the problems:

1. One week appointment for all patients (short-term).
2. Open a trauma clinic on a daily basis at OPD for seeing emergency cases (long-term).
3. Allocate one Orthopedic resident at A/E department (long-term).

The first solution was selected to be the easiest to implement as it was a short term solution that could be implemented quickly whereas the other two solutions faced difficulty in implementing due to manpower, space and financial needs. This solution would be implemented for a period of 3 to 6 months and would only lead to a 75% improvement. It was felt that if the goal of reducing waiting time for appointments could not be achieved then the other two long term solutions would be implemented.

The one week solution was implemented as a pilot study in June 2001 and was found to be workable, so it was decided to continue to for six months starting from July 2001.

Implementation

A letter was sent to the appointment superintendent requesting him to increase the patient list to 120 cases per day from July 2001 and was signed by the Chairman of Orthopedics and approved by the Chief of Medical Staff.

Weekly statistics from Medical Records, telephone calls made to 10 randomly selected patients once a week and interviews with 10 patients at the clinic twice a week revealed that the majority of the patients were satisfied with the new changes in the appointment schedules.

Results

We reduced the waiting period for appointments from 85% to 30% (the aim of our objective being 40%) within 3-4 months. This increased patient satisfaction and

	One Week	Two Weeks	Three Weeks	Four Weeks
Before Implementation	**4.4%**	**20.2%**	**63.1%**	**12.3%**
After Implementation	**70-75.5%**	**10-16.6%**	**8-10%**	**3-5.8%**

reduced complaints, with the added benefit of reducing post-fracture complications.

The following table shows the improvement:

Reccomendations

The other two solutions must be considered to continue the improvement, especially for the future which will see the number of cases increasing. The number of health care providers in A/E and the clinic needs to be reviewed and clinical facilities need to be expanded. Periodic evaluation of the progress of the situation needs to be carried out along with monthly reports and feedback from the appointment superintendent to enable us to determine its effectiveness and efficiency.

Mr. A. Ali Al Khunaizi
Nursing Administration
Salmaniya Medical Complex
Ministry of Health

Improve the Delivery System of Lab Samples from the Geriatric Hospital

Problem Statement

The Geriatric Hospital is a branch of the peripheral hospital within the Ministry of Health. Located in Muharraq, about 10 Km. away from Salmaniya Medical Complex, it is a 85-bed unit consisting of six wards and does not have laboratory, pharmacy or x-ray facilities.

Due to the lack of laboratory facilities, specimens are sent to Salmaniya Medical Complex for investigation. Approximately 4 out of every 10 laboratory results are lost or misplaced on a daily basis, causing delayed investigations which then have to be repeated. The Medical Doctor who is assigned to the hospital finds it extremely difficult to give complete treatment to patients due to delayed lab results. The problem is compounded by the lack of 24-hour coverage by a driver for transporting samples to SMC Laboratory during the evening or night.

1) Patients are primarily affected when procedures have to be repeated and treatment is delayed.
2) Wastage of time: Nurses have to spend a minimum of 10-15 minutes to keep items ready and explain the procedure to patients before collecting the blood specimens.
3) Waste of money: Every time blood is collected, consumables, i.e., vacutainer bottle, needle and specimen card are needed.
4) Cost of laboratory tests.

The goal in this assignment was to minimize the number of misplaced laboratory results and to get cost-effective results on time by the end of the year 2000.

Root Cause Analysis

A team consisting of seven members set out to study the complaints from nursing and medical staff. They reviewed the register containing details of existing procedures, starting with blood withdrawing and dispatching, taking into consideration the time taken to receive results from Salmaniya Medical Complex. The main problems that were identified were as follows:

Employees: Poor communication. Nurses forget to give specific instructions to the driver on which laboratory in Salmaniya Medical Complex he has to deliver specimens. One driver only is assigned to the hospital for various tasks, i.e. pharmacy supplies, store supplies and deliver specimens to SMC Laboratory. He is given many assignments and is unable to deliver the specimens to the appropriate laboratory on time.

Procedures: The process of blood collection registration and transportation to SMC Laboratory takes a long time. The delay and lack of temperature control (Coleman box is required to carry specimens) affects the components of the blood and may lead to hemolysing (clotting). Registration procedure is inadequate since the register does not have columns for the laboratory technician to sign confirming receipt of samples. When results are lost or misplaced, it is difficult to identify the receiving technician since only one box in the main SMC Lab is allocated for the Geriatric Hospital leading to either misplaced or lost results.

Resources (budget): The annual budget allocation of BD.300/- for pathology purposes at the Geriatric Hospital is insufficient to cover the cost of lab investigations and consumables. Extra costs are incurred when results are misplaced and have to be repeated.

Alternative Solutions

1) Develop accurate and clear communication among nursing staff in giving instructions to the driver to deliver specimens to designated laboratory sections.
2) Clear instructions to driver that specimens must be delivered before completing his other tasks.
3) Arrange for an up-to-date register book with the receiver column included in it, to ensure that specimens reach the correct laboratory section at SMC.
4) To fix a lab box designated for the Geriatric Hospital in each SMC laboratory Section, to make it easy for the driver to collect lab results and reduce the percentage of loss or misplacement.

Implementation

The group recommended the printing of color-coded cards for different kinds of specimens to make it easy for the driver to identify the section even if nurses forget to inform him of the location.

After the group explained the importance of making the delivery of specimens his first priority, the driver showed his willingness and cooperation.

Since the Geriatric Hospital Administrator also heads the Muharraq Maternity Hopital, it was agreed that the driver from Muharraq Maternity Hospital will assist in taking urgent specimens from the Geriatric Hospital to SMC laboratory during the evenings and at night. It was also agreed that simple blood tests could be done in Muharraq Maternity Hospital.

Unfreeze

The team recognized the need to change to current practice of sending and delivering lab specimens and results.
The importance of minimizing pathology costs mainly caused by repeated blood collection due to lost/misplaced results.

Refreeze (reinforce)

Nursing staff are well informed of new changes in policy and procedures.
Frequent checking and evaluation of progress after implementing the new procedures.
Nursing Staff showed cooperation and willingness in applying new procedures.

Results

1) There was a noticeable reduction in lost or misplaced lab tests. More than 85% lab results were received on time (2-3 days after dispatch).
2) Reduction in pathology budget utilization.
3) Patient-doctor satisfaction increased with implementation of the new procedures, reduction in complaints.
4) Number of hemolysed (clotted blood) specimens reduced to 0 after the new policy implementation.

Recommendations

There was increased patient satisfaction. Recommendations including the following were made to ensure continued improvement:

- Include members from SMC Laboratory to solve laboratory-related problems.
- Director of Finance to assist with future plans for pathology budget utilization.
- Have direct computer link-up with SMC or Public Health Laboratories.
- Convene regular meetings to evaluate continued improvement.

Mr. Ali Saleh
Nursing Officer
Geriatric Hospital
Ministry of Health

Reducing the Waiting Time for Elective Minor Oral Surgical (MOS) Procedure in the Oral Surgery Clinic

Problem Statement

One of the quality services provided by our department is routine minor oral surgical (MOS) procedures under local anesthesia on out-patient bases, e.g., surgical removal of impacted wisdom teeth.

While the Dental Department at Salmaniya Medical Complex (SMC) has existed since the establishment of the hospital, its role an quality of services has changed dramatically with time. It provided secondary and recently, tertiary care with specialty services in oral-Maxillofacial and periodontal surgery. Our patients (customers) are referred from different sources as follows:

1. Primary Care Health Centers/Dental Clinics.
2. Other departments in Salmaniya Medical Complex (SMC).
3. Facial and Dental trauma from A & E Department which is one of our major sources of referral.
4. Providing dental and oral surgery care and consultation for all the in-patients at SMC.
5. We used to provide dental services for staff at SMC but this services stopped during the last 3 years. Now only severe emergency treatment can be given.

There was no change either in the number of staff, facilities and resources in our department since the early 1980's, despite the increase in the population of Bahrain (650,000 until last year) and the change in the type and quality of services. This situation resulted in very long waiting lists for outpatient clinics, i.e., an average of 7 months for new patients, longer periods for follow-ups, and 8 - 9 months for elective minor oral surgery under local anesthesia in the outpatient clinics at the Oral-Maxillofacial Clinics at SMC. The number of referred patients steadily increased despite the creation of filtration systems, whereby every referral is scanned by the sister in charge, and the patient is re-directed to health centers where other dental specialty treatment is available, except in emergency referrals which are seen as soon as possible. The long waiting lists leave both patients and staff dissatisfied with the services. To measure this problem, we carried out a small study for one week on the average number of new referrals/day to our department and the percentage to oral surgery clinics out of these.

Source of Referral	Range Patients/day	Average/day
Health Centers	**10-18**	**14**
Emergency, e.g., A&E, other departments	**6-10**	**8**
From other departments at SMC	**4-8**	**6**
Total	**20-36**	**28**
Oral Surgery (%) out of total referral	**12-21**	**16.8 (60)**

From the above table, it is clear that our human and physical resources cannot cope, if quality services are to be continued at satisfactory levels.

Root Causes Analysis

My goal in this project was to reduce the waiting list for MOS appointments, and I needed to build a team that will carry out the responsibility of introducing the new change. In an attempt to apply Belbin's team roles, I was faced with the limitation in the number of staff (who were already overworked) in our department but succeeded in enlisting the Chairperson of our Department, the sister-in-charge, my assistant who is a practical nurse and the Clerk/receptionist. The team discussed the issue and conducted a fishbone analysis of the situation after which we established *the following Smart Goal: "Utilizing a short notice appointment system for elective MOS, to reduce the waiting time for surgery under local anesthesia, from 9 months to 5-6 months and achieving this within the time scale of 5-6 months".*

The team decided to collect data from the following sources to evaluate the extent of the problem:

Front desk appointment system: from data collected by our receptionist who had access to the central appointment system at SMC, it was clearly evident that it took 8-9 months to get an MOS appointment with one of the Oral Consultant Surgeons.

Interviews with patients: results of a survey on 20 randomly selected patients who were given MOS appointments, confirmed what we already knew about patient dissatisfaction with the waiting lists, aggravated by lack of alternative solutions for the waiting time for appointments.

The following root causes for long waiting lists for MOS were identified in the Fishbone analysis:

- **Inflexibility of the appointment system:** Absence of follow-up to confirm appointments to prevent defaults.
- **Systems:** Dentists in health centers need more training to reduce unnecessary referrals, lack of education for patients before referral. Lack of communication with SMC Administration, lack of strategy and vision for the department in SMC, lack of appreciation or acknowledgement, free health care and misuse of system.
- **Staff:** Shortage of staff, overload, low morale, frustration, lack of training and no stability, no Resident dentist is available, only trainee dentists are available on rotation basis, number of dental assistants is fixed.
- **Inadequate Resources:** 2 oral surgery clinics, no increase in the number of dental clinics and no recovery room is available, old chair and equipment.

Alternative Solutions

Once the root causes of the problem had been identified, many solutions were discussed, the most important alternatives were:

1) **Flexible appointment system:** Change in the central appointment system to enable confirmation of appointments and reduce defaults. This solution was difficult to enforce on a short-term basis as it involves change in the central computer system through which appointments are made at SMC for all departments. Shortage of staff essential for confirming all appointments was a major obstacle.
2) **Increase the number of staff:** One of the solutions was to increase medical staff by recruitment for permanent Residents' positions in Oral Surgery where they can reduce the workload. Financial/budgetary constraints and bureaucratic administrative systems require long term solutions which cannot be solved immediately.

3) **Increase resources and facilities:** The team recommended that more clinics should be built to cope with the increase in patients. Apart from budgetary constraints, there is the problem of physical limitations as the department shares the floor with the Eye Department who are also considering expansion themselves.
4) **To establish a short notice waiting list for MOS and run it through the outpatient clinics by means of the following system:**
    i) All MOS patients will be given an appointment through the Front Desk Computer list giving patients the right to have an appointment, at the same time they will be offered the option to re-register their names in the short notice appointment book with their telephone contact numbers, with their appointments being confirmed early in the morning on the sameday.
    ii) The practical Nurse (my assistant) was given the task of calling only the MOS appointment from the original computer appointment list, between 7:30 a.m. until 8:30 a.m. (during the morning ward rounds) before starting the clinic at 9:00 a.m. If there were any cancellations, she will then call the first patient on the short notice waiting list, so her job was to make sure no appointment will be missed due to defaults.
    iii) Patients who are seen through the short notice list and complete their surgery, will have their original appointment on the computer deleted by the receptionist who will then allocate that appointment to another patient.
    iv) The Sister-in-Charge will provide the free direct telephone line early in the morning by making sure no one uses the telephone at that time for unnecessary calls. She will also make sure that extra surgical sets are available and that there are no interruptions between our department and the Central Sterilization Department that may delay the arrival of surgical instruments needed for MOS patients.

A pilot study, with only one oral surgery clinic participating, was carried out for two weeks (each week had a 3/day clinic). In this study all default appointments were used and 6 patients had their surgery by skipping the routine appointments, and their routine appointment being given to other patients. One major problem was when patients on the short notice list were called, they did not have sufficient time to prepare themselves (work and transport). This was resolved by changing the computer template for all MOS appointments to start from 11:00 a.m. onwards, which would give patients adequate time from 7:30 - 8:00 a.m. until 10:45 a.m. to arrange to arrive on time.

Implementation

We started out by explaining the project to all staff so that the two oral surgery clinics will be involved. Unfortunately, there were problems in implementing this change in both clinics simultaneously because:

- There is only one direct telephone line as one is reserved for emergency calls.
- Lack of willingness on the part of nurses and assistants in the other oral surgery clinic to participate in the project.

Therefore a decision was made to go ahead with only my clinic. To unfreeze the situation, we started explaining to patients and staff about the short notice appointment system, encouraging them to register in that book. By this stage, all staff in the department were aware of the system and helped patients to register. The coopera-

tion of nursing staff and recipients made this project move with the least resistance, although it meant more work for them, as they reported, they now had something extra to offer patients to alleviate their anger and dissatisfaction with the long waiting list.

We refreeze the change and it was reinforced by daily practice. Staff are empowered to solve any problems directly as part of the daily services provided.

Results

Data collected after implementation of the changes showed that there was a reduction of 37.5% in the waiting time list for elective MOS by eliminating waste in appointment defaults.

The overall achievement has also enhanced motivation, elevated morale and reduced staff resistance to change.

Recommendation for Continuous Improvement

This project was a very good exercise for our department and helped highlight other problems and opportunities for improvement. In discussing alternative solutions, the chairperson and I teamed up to address long term problems which results in the following:

- Trainee dentists had to have longer training time and responsibilities in our department during their rotation. They are going to be paid for on-call duties which will make them share more responsibilities in patient management.
- As a result of several meetings with officials in the Ministry of Health and a more recent meeting with the Undersecretary, three positions for permanent Residents have been allocated in our department. Two of these residents will joint the department in February 2002 and will address the shortage of staff.
- Meetings were held with the Engineering Department to study the feasibility of expanding our department within the same building. The blueprint/drawing by the architect showed the possibility of having two extra clinics and one recovery room within the existing building. The project was presented to the Administration where it will be allocated for the 2002/2003 projects budget.

These are examples of continuous quality improvement that I have been working on since my return from Postgraduate training in August 1999 and joining the Management course boosted my efforts. The Chairperson and staff of the Department have been very cooperative, and we have all agreed to continue with our efforts to:

- improve the appointment system,
- reduce defaults and minimize waste of clinical time,
- continuously evaluate and get feedback from patients (customers) and staff to their satisfaction.

In conclusion, the CQI (Continuous Quality Improvement) is the way forward in achieving short and long-term objectives and in being customer and staff oriented all the way.

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Imbalance Between Experienced and Inexperienced Nurses in Clinical Areas created by Bahrainization at Salmaniya Medical Complex

Problem Statement

A major impact on the quality of nursing care was due to rapid termination and replacement of experienced non-Bahraini nurses by inexperienced Bahraini graduates. The decision by Ministry officials to withdraw the counterpart system and to recruit new graduates on replacement basis, made it difficult to train them in the absence of experienced nurses. Graduates are not given the opportunity to adjust or go through a transitional period from a student's role to a staff nurse role. Work expectation is very high and inexperienced graduate nurses are unprepared with the stress and pressure of working independently, to take over team leader roles or to deal with critical or emergency situations. The overall target is to create a system to maintain a balance between experienced and inexperienced nurses for the coming two years and initiate action to redirect nursing graduates to work in critical areas and to work in Psychiatric, Geriatric and Maternity Hospitals.

Root Cause Analysis

A team was established, consisting of nursing officers who were carefully selected according to Belbin team roles. Available information revealed that nearly 47% of nursing manpower in all hospitals are non-Bahrainis; out of these, 30% are working in specialty areas. There will be a serious implication on patient care if the graduation rate of 100 nurses per year is maintained, and we keep on recruiting them on replacement basis, especially for the specialty areas. It will be very difficult to terminate experienced non-Bahraini nurses from specialty areas and replace them with freshly graduated, inexperienced nurses.

There is no National Plan for Nursing Resources that would determine the intake into the nursing programs at the College of Health Sciences. Nursing officials are not involved in policy formulation or human resources planning at Ministry level.

Nursing officials are not involved in the committee that currently comprises the Department of Personnel, Training and the College of Health Sciences. The decision to increase the number of students into the Nursing Program at the College of Health Sciences, in order to achieve 50% Bahrainization of nursing positions, set by the joint committee (between the College and the Services) by the year 2000, created problems because all graduates are absorbed into Salmaniya Medical Complex.

There is no standard ratio between experienced and inexperienced nurses to ensure that the services in clinical areas will not be affected due to the decision to withdraw the counterpart period due to budgetary constraints. Job insecurity due to terminations caused by Bahrainization resulted in many non-Bahraini nurses, in specialty areas, leaving for better opportunities offered by agencies outside Bahrain.

Solutions

The members discussed the issues extensively and several options and possibilities were put forth but it was decided to concentrate on the objectives of this project and study other strategies at a later stage. The following solutions were suggested towards achieving the stated objectives:

A. Short term:

1. Establishment of a counterpart period of 6 months duration, to enable newly graduated nurses to build up their clinical skills and experience.
2. Involve nursing services in the committee responsible for decisions on intake into nursing programs.
3. Redirect percentage of graduates to Psychiatric, Geriatric and Maternity Hospitals.

B. Long term:

1. Establishment of preceptorship in each level to be responsible for training and development of nurse graduates.
2. Develop standard ratio for the number of experienced to inexperienced nurses in each specialty.

Implementation

A decision was made to work on alternatives 1, 2 and 3 as an immediate and short-term solution, with 1 as long-term.

1. **Involvement of Nursing Services**
   The Directorate of Training was approached to discuss the College of Health Sciences intake, stressing the importance of nursing services representation at committee meetings. This resulted in the Chief of Nursing Services being listed as a member of the committee.
2. **Re-direction of percentage of graduates to other hospitals**
   A letter was forwarded to the Chairperson of the Nursing Development Committee regarding the employment of newly graduated nurses in other hospitals. The committee discussed and endorsed the proposed solutions, but recommended to start with a limited number of students being sent to other hospitals for on-the-job training.
3. **Establishment of six-month counterpart period**
   Discussions were held to re-establish the counterpart system and budget availability between the Chief of Nursing services, the Directorate of Personnel, Directorate of Finance and representatives from the Nursing Division at the College of Health Sciences. A proposal was sent to and approved by the Civil Service Bureau to create 100 trainee positions on the organization chart of the Directorate of Training, payment of BD200 stipend to the nurse trainee.
4. **Establishment of Preceptor-ship**
   The need for establishing preceptor-ship received support from officials from the Directorates of Finance and Personnel. Information was requested on the need for establishing such a system, manpower requirements, job descriptions and the criteria for the positions.

Recommendation

The project provided an ideal opportunity to meet and interact at all levels, with team members working closely to achieve specific targets. To continue monitoring and evaluating the implementation of the proposed alternatives, it is recommended that:

1) Evaluation will be carried out during and at the end of the counterpart period to determine the effectiveness and efficiency of the system.
2) Monitor feedback on the performance of new graduates and any problems, from Nurse supervisors from the peripheral hospitals. Work with them to resolve problems, if any.
3) Work on completing the proposal for preceptorship, putting together required information and follow-up on the process until approval is obtained.

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Improve Patients Satisfaction with the Services Provided at Accident and Emergency Department

Introduction

For the past few decades Quality improvement has been used as a method of sorting out defective products and services, but with the work of W. Edward Demming, the concept shifted towards improving the production system to prevent defects. Quality is defined as meeting or exceeding the needs of the customer, and the goal is to find out what customers want and to fine tune the process to ensure that they get it. Demming's teachings covered a number of techniques for process control and the philosophy that quality should be the responsibility of everyone in the organization.

Problem Statement

Our mission statement in the Accident and Emergency Department was to provide extensive, comprehensive high quality emergency care to critically ill and injured patients. While a lot of work has been done in A/E Department to improve the services and encourage teamwork, all the work concentrated on the structure and the organization of our services. This study reviewed the results of those efforts from the patients' perception and to define departmental weaknesses, so that we could reach an optimum situation to meet the mission and strategic goals. The average number of patients visiting the A/E department is 750 per day, and it estimated that about 400 of those patients are redirected to different health services through the triage system.

The aim of the study was to concentrate on the external customer (the patient) who has been neglected and far from being considered in the previous studies, identify the areas of dissatisfaction (our areas of weakness), analyze these areas and find the root causes, generate alternatives, plan for necessary changes, follow-up by their implementation and finally, evaluate and standardize the new changes. This study was expected to act as a mirror, reflecting the real image of A/E in the patients' eyes. This step was to complement efforts that started a year previously through the introduction of a team management style in the department and could be considered as a milestone in reaching excellence of performance.

Root Cause Analysis

The project started out with the formation of a team according to Belbin's Team rules, with the involvement of the following staff of the A/E Department: administrative, physicians, nurses and medical records. An operational team (medical students and other staff), conducted the survey comprising of 34 questions which covered the four important services at A/E, i.e., reception, nursing, physician and facilities.. Data collected would be analyzed/evaluated and appropriate recommendations for improving the services would be submitted. The first survey conducted from 15th June to 15th July, 2000 was carried out on a sample size, subsequently calculated as 248 patients with 95% precision and 5% margin of error was divided according to the proportion of visits in each of the three shifts. The data collected was then analyzed to determine the degree of patient satisfaction. The survey highlighted the following problems experienced by patients at A/E:

1) Receptionists were unsympathetic and slow in registering procedures.
2) Lengthy periods of waiting to be attended by nursing and medical staff.

3) While less than 66% thought that nurses were friendly, 67.3% felt that nurses gave them their full attention and 63.3% were satisfied with nurses' communication skills. 61% felt that they did not receive adequate explanations on their condition, and only 34.4% thought that their transfer to the appropriate specialty was fast.
4) Only 75.4% of the patients felt that doctors gave them full attention, while 67.7% had physical examinations performed. 73% were able to communicate well with their doctors and less than 50% had investigations, medical condition or treatment explained to them

Following the survey, individual staff in each discipline were asked to determine the degree of patient satisfaction with the services they deliver. Meetings were held with each group to formulate a contingency plan designed to overcome providers' shortcoming. A team, comprising of members from the various disciplines/services, was formed to observe progress in the implementation of the plan, adherence to performance and recommend possible changes.

A second survey was conducted using the same questionnaire 21/2 months later (from 1st to 30th October, 2000) and a similar number of patients were interviewed in the same manner, no further provider expectations results were taken. Results were as follows:

1) There was no significant change from the first survey.
2) Lack of customer relation service among clerks.
3) Nursing services showed some improvement in communication skills only. No significant changes were noted on other nursing functions despite clear instructions and team observations.
4) There was a slight improvement in the quality of medical care and attention. Better medical examinations, explanations and investigations were noted.

A meeting with each type of service was arranged to inform them of the results.

Recommendations

The results were disappointing in terms of professional skills, since it revealed non-adherence to basic professional care.

1) Formation of a CQI team from the different disciplines of the A/E
2) Establish communication skills programs for all A/E staff
3) Improve medical background for all A/E staff
4) Dissemination of better information/material to patients
5) Improve doctor-nurse communication
6) Create standard procedures and medical management protocols.

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Dr. Ali A.Saleh
A/E Department
Salmaniya Medical Complex

A Plan for Triage System in the Accident and Emergency Department

Introduction

The Accident and Emergency Department of SMC is designed and staffed for quick evaluation, treatment and disposition of a large number of patients.
SMC is the main government hospital of Bahrain. It has 600 beds, secondary care and caters to an average of 450 patients per day. The department adopted a strategic goal, which is to establish a Triage system in the Accident and Emergency Department within 2 years. In a hospital setting, triage is used to assess the urgency of the condition of the patient. The decision to establish triage system is based on the outcome of a multi-disciplinary team workshop in December 1992 at the Accident and Emergency Department, with 60 participants including nurses, doctors and paramedics.

The role was to identify problems that concern the Accident and Emergency Department. A questionnaire was prepared and distributed to all the staff members for completion. The group identified 15 problems. The participants then prioritized the responses, resulting in 5 top priorities, one of them is to establish the triage system in Accident and Emergency department to achieve the following: Assess and categorize the seriousness of patients on arrival without delay, give priority in treatment to serious patients based on their triage category, provide immediate treatment to critically ill, communicate with treating doctor and relatives of the patients.

Justification of Triage

The Accident and Emergency Department serves all the population of Bahrain. The department served 144,997 in 1991 and 163,044 in 1992. 74% of the cases were non-urgent and stable condition. There is different mix of cases in the waiting area, and there may be unexpected casualties in this area.

The Planning Process and Implementation

A) **Human resources (8 Nurses)**

1. **Selection of nurses:** Triage training was offered to all nurses in A& E. Those who are interested were subjected to a written test and interview.
2. **Training of Nurses:** Training was held for 4 months and comprised lecture, documentation, practical training and field training.
3. **Trial run (August - December 1994):** Trial run of Triage service was initiated for a period of 4 months from 10:00 to 12:00 midnight. During this period 70,182 patients attended A&E Department. Only 27,952 (40%) were Triaged by nurses. Only 24 (0.8%) were labeled Red, 5,383 were Orange, (61.5%) were Blue and 18.3% were yellow.
4. **Evaluation Triage:** Mrs. Mary Wilson who is an expert triage nurse from Beamout Hospital, Ireland was invited to assess the trial. She suggested changes, which were implemented.
5. **Full Scale Implementation:** Round the clock triage services was initiated in January 1995

B) **Physical Requirement**

1. **Space for Triage:** The Triage system requires new arrangement in the department outlay. The engineering department prepared drawing for the triage area based on the requirements. The maintenance section

took 6 months for the construction of the required layout.

2. **Equipment:** The required equipment and facilities were purchased as per the normal procedures of MOH.

C) **Public Education**

Weekly TV interviews for 6 months, Media release in the Newspaper and Pamphlet distribution should be done to create awareness among the general public.

D) **Interdepartmental awareness**

It was decided that a policy should be adopted for the interdepartmental awareness.

1. Formulation policies: Triage criteria and related policies were written and discussed
   - Red — Critical
   - Orange — Very Urgent
   - Blue — Urgent
   - Yellow — Non Urgent
2. Special form was designed.
3. The methods of communication between patients, relatives and doctors were established.
4. Periodic meetings and lectures with all concerned members in the department.

The Planning Process and Implementation

As a manager believing in Management by Objectives (MBO), the segmental objectives were identified for each group, and monthly meetings were held to review the progress of each group's achievement. Minor adjustment or alterations were considered.

Dr. Aziz Yousif Hamza
Undersecretary
Ministry of Health

Decreasing the Length of Visits to Pediatric Clinic

Introduction

The Ministry of Health (MOH) in Bahrain has many strategic goals; one of these goals is to deliver high quality services to all the patients. The mission of Pediatric Department at SMC is aligned with the mission and vision of the MOH and SMC- that is "SMC exists to continuously meet the health care needs of its patients, in the most efficient and effective manner, at the highest level of quality within its available resources".

It is very important to review the situation regularly to ensure that we are providing the right service for the right patient, to meet the needs of pediatric patients and their families. The pediatric age group from 0-15 years contributes to almost 31% of the total population of Bahrain. The pediatric out-patient clinics run 5days/week, a total of 56 clinics/week. An average of 180 - 200 patients are seen each day, putting a huge burden on the staff (doctors, nurses and clerks) and the patients as well. Ninety-five percent of the pediatric patients are follow-up patients.

The pediatric patient list (as recommended by hospital administration) is 18 patients/day of which there are 4 new patients per list but can reach more at times, with consultation times of 15 minutes per new patient and 10 minutes per follow-up patient for the time period of 9am-12:30pm per day. But in reality, doctors sometimes spend almost the whole working day in the clinics. Patients often have to visit different locations in the hospital (registration desk, laboratory, radiology, etc.) which takes time and results in complaints from both doctors, as well as patients.

Problem Statement

It was defined as "the length of a visit to the pediatric outpatient clinic is >1 hour in 61.5% and <1hr in 38.5% of the patients". To provide the best care for the children and their families, we need to manage the time factor properly, i.e. the length of the visit, to ensure the compliance of the patients with their clinic visit, since many of our patients have chronic illnesses with frequent visits; and most of them are school aged children attending the clinic with their parents. Their frequent visit must have an effect on their schooling and on the parents' job by frequent absence from the work place. Our mission is to decrease the length of the visit to the pediatric clinic to <1 hours for 60% of the patients by January 2002".

Root Cause Analysis

We started with brainstorming, which usually encourages creative thinking. Questionnaires were distributed to the patients. Using stakeholder information technique, the team identified different causes as follows:

Patients lack awareness, not following schedules, lack of feedback, etc. **Reception Clerks** lack motivation; have many responsibilities, lack of awareness and shortage of staff. **Doctors** have many lists of patients and limited time per list, not following time schedules and contradicting rules. **Tools** No lab results, x-ray films and auditing, no computer, poor filing and the appointment system. **System-** Resistance to change, old management styles and procedures, poor communication and considers quantity vs. quality.

But the one which we thought was the main cause of the problem is related to the health care system policies, procedures and tools and old management style.

Alternative Solutions

Using brainstorming technique, the committee members proposed the following solutions:

1. Change the system policy by sending the patients directly to the doctor room and to register at the end of the consultation while taking the next appointment.
2. To keep computer in the clinic to have access and can easily printout the patient's lab result after checking the files, instead of sending them to the laboratory.
3. To get the x-ray films to the clinic daily instead of sending the patients to the radiology department to get the films by themselves.
4. Increase the awareness of both the patients and the staff to the existing problems and encourage them both to at least follow the time schedule.
5. Decrease the number of patients from 18 to maximum 12-14 patients. This will help the doctors to have enough time to investigate their patients and will improve the quality of work, as well as being able to see his patients according to right time.
6. Increase the number of reception clerks and regular auditing system for the clinic and feedback for all concerned people.

Implementation

Kurt Lewin model was used to facilitate change (Unfreeze-change-Refreeze).

1. Communicating the change:

We started **unfreezing** by explaining to the people concerned, mainly the pediatric clinic staff and the hospital administration. We needed the staff to understand the importance of this change to improve our service. We provided them with the data we obtained from the questionnaire. We provided the clinic with cards, which carried the names of the doctors in Arabic and English. These were hung on the doors of each doctors' rooms, and they were changed daily according to the doctor's schedule.

A notice board was fixed in the waiting area near the reception desk, which carried the doctors' names and room numbers on a daily basis.

2. Strengthening driving and weakening restraining forces (Change):

Please go directly to the doctor's room. Providing a good communication system will ensure that the patient understands this message. We did a short training session for our staff in the clinic for what is needed from them with this change and on how to utilize the computers for launching out the results.

3. Then we refreeze the change:

To reinforce it, so it becomes part of our daily services. Continuous communication will ensure that the need for change is understood. Provide support for those who are not doing well and anticipating resistance to change by listening, communicating and seeking opinion.

Results

The main aim of the project was to decrease the length of the visit to the clinic with no alteration or increase in the patients' satisfaction in general.

Time/Hour	Before the change		After the change	
	No. of patients 98	Total %	No. of patients 42	Total %
<1/2 hr	14	14	7	16.5
1/2-1 hr	24	24.5	17	40.5
1-1 1/2 hr	25	25.5	3	7
1 1/2-2 hr	16	16.5	8	19
>2 hr	19	19.5	7	16.5

The table above illustrates the length of the visit in the pediatric clinic before and after the change.

Satisfaction rating	Number of Patients	%
Excellent	19	41.5
Very Good	14	30.5
Good	8	17.5
Fair	4	8.5
Poor	1	2

The table above shows total patients responded is 46/50. Only one patient was not satisfied with the change for unstated reasons, and 4 patients gave a rate of fair, which we considered as poor.

Recommendation

Despite the changes we made, we couldn't decrease waiting time because doctors spent more than the scheduled time with patients. However we can continue to study the effect of this project on the doctors and patients and satisfaction/quality improvement after implementation by establishing outpatient auditing for at least two to three months and improve communication skills between the committee, patients and staff through continuous feedback. Producing leaflets about the pediatric outpatient's clinic, goals, rules and regulations, and the appointment systems, concentrating on the importance of following the appointment procedures. Establishing a system of taking appointment by phone from home without waiting in long lines near the reception desk. Conducting other non-budget projects to improve quality and increase patients' satisfaction, getting feedback from concerned parties to ensure continuation of the process and examine staff satisfaction with services provided to patients.

Because of the shortage of time we could not implement all the factors suggested by the team, although the change was significant. As we did not get all the approval we needed to implement this project, the subject is still under process with the most important factor being the decrease of the number of patients waiting time, as it is still a problem. Although 90% of the patients were satisfied with the change, it would have been better if we had their opinion before the change as well.

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The Use Of Infiltration (Local) Anaesthesia In Minor Hand Surgery

Problem Statement

Minor hand surgery is one of the most common operations performed by an orthopedic surgeon. Usually, it is done at Salmaniya Medical Center (SMC) using the technique of intravenous block anesthesia. This requires the presence of an anesthetist and anesthetic technician. It occupies a significant portion of theater time and with the presence of several minor hand operations, the time allocated for other procedures, especially major operations is, significantly affected. Although the actual time; to do the operation is short, the time needed for the patient to stay to reverse the effect of I.V block is long because earlier release of the block will result in complication because the anesthetic agent will go to the general circulation and may result in cardiac complications.

The allocated time for each session is 6 hours. The number of sessions per week is 2. The number of minor hand surgery per session is 2 and the time taken for each hand operation (including anesthesia time) is 40 minutes.

Our aim is to reduce the time taken for each hand operation by implementing another type of anesthesia (local infiltration). The target was to reduce the time from 40 minutes to 12-20 minutes. This will free up more time that could be utilized in performing other procedures on the theater list

Root Cause Analysis

The team members were selected based on Belbin's team roles; and using the brainstorming technique, we identified the source of the consequences and the problem of the intravenous block anesthesia on theater time utilization. We have found that this technique consumes significant theater time and does not allow the theater utilization for other operations, particularly the major operations. The consequence of this is a longer waiting list for elective operations and significant utilization of human resources including the presence of an anesthetist and anesthetic technician, which could have been used in other theaters for major surgery. Intravenous anesthesia block is also painful, since it requires the application of pressure cuff on the area for at least 20-30 minutes. This is extremely uncomfortable for the patients and sometimes requires giving the patient sedation. As a result, the patients have to stay in the recovery room for longer time; and this in turn disrupts the flow of patients to the recovery room.

Alternative Solutions

The team discussed other possible solutions with the aim of finding a firm solution to the problem and the following solutions were suggested:

- One solution was to retrain the surgeon to do the intravenous block anesthesia and thus avoid the need for an anesthetist to be present.
- The other solution was to use infiltration local anesthesia with 1% Xyclocaine.

After discussing the benefits of these solutions, the team finally decided to use local infiltration anesthesia for common hand operation instead of intravenous block anesthesia, as it is a simple and a cheaper procedure. It is done by the surgeon himself and does not require the presence of an anesthetist. All this has to be explained to the

patient prior to the introduction of the anesthesia, which is quick (1-2 minutes), immediately reversible and tolerated very well by the patients. It is easy to perform, residents can be trained quickly, and the technique was performed in the same theater with the same staff nurses. In other words, the patient can leave the operation theater immediately after the procedure without the need for him to stay for reversal of the effect of anesthesia, like the IV Block anesthesia.

Implementation

We set a time of 3 months for the study and the number of cases to be included (40 patients). We created a table to record the time the patients came to the theater, the time of introduction of anesthesia, the time of operation and the time the patients leave the theater, (Operating theater time sheet). The team personally filled these forms immediately so as to specifically identify the actual time needed for each step of the process. Orthopedic Residents were trained to execute the procedure, and they became familiar with it very soon as it is very easy to perform. We used the Lewin's Model in this regard. First, the process of unfreezing was used to identify the driving and restraining forces and the next step was to implement this change. Each step was followed very closely and familiarity with the technique was monitored and checked for needed adjustments. In the final stage, all these changes were reinforced (refreeze) and slowly accepted as part of the system.

Results

The table below shows the results before and after implementation.

	Before	After
Number of cases per session	**2**	**3**
Time taken for each minor hand surgery	**40 min**	**20 min**
Percentage of time taken from each theater session	**33%**	**16%**

As observed in the table, after implementation of the new technique of local infiltration anesthesia, we started to do more cases in each theater session (from 2 - 3) and the time needed for these cases was significantly lower (only 16%) compared to 33% before the implementation.

Reccomendations for Continued Improvement

More careful planning over a longer period of time, cooperation and the involvement of all the Orthopedic Consultants and Residents in this project will lead to continued improvement in services and will have a significant impact on improving the waiting list of both minor hand surgeries and other procedures.

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Reorganization of Out-patient Clinic in the Department of Ophthalmology

Background Information

Ophthalmology Department at Salmaniya Medical Complex is the only department in Bahrain that provides specialized eye care and accordingly receives referrals from all health centers, hospitals and private sector. The increasing number of patients attending eye clinics is indicative of people's awareness of the high standard of health care, complemented by an improvement of Primary Care health services provided by health centers. Screening programs for certain eye conditions among children and elderly patients has also increased the referral of patients.

On the other hand, the department has to satisfy its doctors' aspirations to update their knowledge and develop their subspecialty eye care. The establishment of the Arab Board Program in Ophthalmology will bring about an improvement in the training facilities for residents by providing the appropriate environment and teamwork in the department.

All these forces provided the background for a planned organization of our department. I am a member of the department's management team, which reviewed and identified problem areas, identified customers and suppliers for our services, with the aim of setting priorities for improvement in organization. The team's first priority for change was the organization of the outpatient clinic with its large number of patients and rather disorganized set-up.

To initiate the process of change, we created the "Out-Patient Eye Clinic Design Team", which I chaired.

We set two main objectives:

- To provide high quality secondary and tertiary care in the department by establishing subspecialty services
- To establish a training program for Arab Board

We started our field analysis to recognize the forces for change and the forces against the change:

FORCES FOR CHANGE	FORCES AGAINST
Internal Forces:	
1. The desire to establish good quality care	**1.** Shortage of staff (manpower), nurses doctors and clerks
2. Establish subspecialty services	**2.** Lack of training of doctors and nurses
3. Establishing Arab Board Program	**3.** The layout of outpatient clinic
4. External Forces: Competition from private sector in Bahrain and overseas in the neighboring countries	**4.** The eye clinic is away from other out-patient clinics, lab, x-rays and medical records.

Due to the lack of problem-solving skills among the team, I explained some basic rules about brainstorming, benchmarking to recognize the need for change. On the positive side, the team was enthusiastic and worked together to find solutions; they contributed with suggestions and ideas. We did a brainstorming; but were not able to resolve many of the problems, due to manpower shortages and the need to improve communication between Primary and Secondary Health Care in setting up

a policy to reduce over-referrals from health centers. Attempts to assign a TPN as temporary receptionist were unsuccessful.

Areas of Organizational Change

Job Design

Lack of teamwork

- Consultants in the clinic spend their time attending to new patients referred from health centers and are unable to see difficult cases referred by residents for secondary opinion.
- Consultants do not have time to teach and discuss difficult cases with residents.
- Consultants cannot establish the subspecialty clinics due to overload caused by the number of patients.

Structure

- The overall design of outpatient clinic with the absence of reception facilities, limited space/ waiting area, and the limited number of consulting and screening rooms.
- The Eye Clinic is situated away from the medical records section and the absence of a messenger to bring medical records.

People

- Change the attitude of patients to respect the appointment system, to wait in the waiting areas, and reduce the tendency of patients to walk into consulting rooms, etc.
- Educating patients by providing instructions on examination rooms and reception.
- Increase the performance and affectiveness of nurses by improving their skills in screening and preparing patients for doctors' examination.
- Improving doctors' skills in identifying cases which need referral to health centers by establishing a discharge policy and follow-up protocol for patients.

Practice/Recommendations for Change

According to the following priorities:

1. Reduce over-referral by:
   - Establishing a multidisciplinary team to communicate with health centers to set a policy for referral.
   - Establish a policy for discharge and referral to health centers.
2. Establish a reception to direct patients to different examination rooms.
3. Provide screening nurses to establish criteria for accepting patients for out-patient care at appointment or emergency clinics.
4. Issue instructions to patients on appointment procedures, avoid knocking on doors of consulting rooms, and wait in areas assigned for waiting.
5. Notices/instructions to be placed on walls to direct patients to different examination rooms.
6. Retrieving and sorting files in the clinic one day before appointments.
7. Arrange firms as a team with a nurse looking after each firm

About the Team

We need to identify team performance opportunities by:

- Dividing into sub-teams for specific issues or improvement opportunities.
- Staying together as a team will strengthen rethinking as a team, as well as build confidence and commitment to one another in overcoming obstacles and moving ahead.

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Over Utilization of Laboratory Services at Salmaniya Medical Complex: A Study of Hemoglobin Electrophoresis and Glucose-6-Phosphate Dehydrogenase Activity

Problem Statement

The number of laboratory tests performed at the Department of Pathology, Salmaniya Medical Complex (SMC), Kingdom of Bahrain has increased tremendously during the last few years (Annual Report 1997). Previous studies showed that 14.2% of requests for laboratory tests are repetitive, unjustified and unnecessary. This observation is to be tested.

Since haemoglobinopathies and G6PD are very common in Bahrain, it was felt that tests requested by the clinicians to screen and diagnose these clinical conditions are overutilized by repeating the same tests, as the laboratory findings will not change, because the conditions are inherited and coded in the genetic structure of every individual. The aim of this project is to verify this overutilization, quantify the problem and establish measures to reduce and, if possible, cut this load. Follow-up is necessary.

Root Cause Analysis

To verify the problem, a one-week pilot study was carried out between 10 June 1998 and 16 June 1998. The results showed that 13.4% of all electrophoresis requests were repetitive. This rate however is within the estimated annual increase of workload and may also be over-inflated by the inclusion of the follow-up cases of hemoglobin A and F estimation. This part of the project requires further analysis.

As for G6PD, 6.2% of the tests were also repetitive and double the annual rate. Moreover, since G6PD results are not affected technically or clinically, this significantly represents unnecessary overutilization of laboratory service.

The possible causes of this overutilization include the following:

1. Doctors are unaware of the cost of medical procedures and are able to request any test, whether clinically justified or not.
2. Doctors do not examine patients' records and are unaware that these tests were previously done.
3. Health Center doctors often doubt the results of tests from their local laboratories and refer the patients directly to SMC laboratory, but they are unaware of the procedures carried out in SMC for their patients.
4. The test in question does not appear on the Discharge Summary Sheet of patients.
5. The computer network of the Ministry of Health is not accessible for checking of laboratory results.
6. Laboratory staff are aware of repetitive tests but have not taken further action to find a solution due to past attempts which were unsuccessful.

Solutions and Implementation

The solution to the above problem is that SMC Laboratory accepts all requests but perform the analysis only after checking the computer database to confirm that tests were not done before. But the laboratory should still provide a copy of previously performed tests so that patients and doctors are served. The implementation of this

procedure using either Lewin's or Kotter models was not possible because of a number of limitations. Instead, the Modified Comprehensive Approach of Change was successfully applied in a two month study.

Results

A two-month study was done and the following are the main findings:

1. 6.3% of electrophoresis requests were repetitive and unnecessary. This rate is less than the one-week pilot study due to the exclusion of follow up cases of haemoglobin A and F estimation.
2. 5.6% of G6PD tests are also repetitive and unnecessary. This rate is nearly similar to the one-week pilot study and can be regarded as a significant indicator of overutilization.
3. Analysis of annual records and the two-month study showed that the estimated number of monthly repetitive tests for electrophoresis and G6PD would be about 200 tests (100 each).
4. If LPP rates are considered as BD 9 for these two tests, than the average cost of these tests would be 200 tests x BD 9 x 12 = BD 21,600.
5. SMC accounted for 47% of total electrophoresis and 36% of G6PD repetitive tests and the remainder are from Health Centers.

Recommendations

The health authorities in Bahrain must address the problem of overutilization of all diagnostic services and its cost implications on the health system, because haemoglobinopathies are common in Bahrain. Overutilization of tests related to these diseases must be prioritized. The issue on overutilization of laboratory services should be given appropriate solutions for better improvement. All results must be entered in the national computer database, which should accessible for doctors to verify previous tests and avoid duplication. Education on these laboratory tests and their results should be provided to all concerned including patients; and results of these tests must be shown on the cover page of the hospital record files, health cards and other relevant clinical identification sheets. The computer network should be expanded to cover all health delivery areas, and the number of terminals should be sufficient for concerned parties to access information.

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Ineffective Use of Paediatric Day Care Unit at Salmaniya Medical Complex

Problem Statement

The 6-bedded Pediatric Day Care Unit, built as an extension to the Pediatric Department, was opened in 1996, and is used for the care of patients suffering from Thalasaemia Major and Sickle Cell disorders, who require life-long and continuous treatment. They need special care, appropriate education and a pleasant environment to help in reducing their anxiety. Ineffective utilization of the Unit, its services and facilities resulted in patients losing interest in their treatment plan and education, and become non-compliant and stressful.

Patients' dissatisfaction with the Unit was brought to the attention of the management, who did not understand patients perception of the care they receive, or understand the occasional complaints or expression of happiness related to the quality of care, facilities, personnel and environment. Management did not have a perspective of the problem and only solved superficial issues for a particular person or situation. In order to provide quality care and increase productivity, an assessment of the services at the Unit needed to be carried out to analyze the main causes of dissatisfaction. A team was identified according to Belbin's team role and participated in the project from its development to its implementation.

Objectives of the study:

- To determine patients/parents perception of the quality of care at the Pediatric Day Care Unit.
- To identify causes of patients' non-compliance to the course of treatment.
- To identify the quality and weaknesses in the system .
- To demonstrate appropriate action and proper utilization of resources.

Root Cause Analysis

A survey was conducted for two weeks and the information that was collected analyzed to identify potential causes that seriously affected the patients and quality of care at the Unit. The study revealed the following problems:

1. Inappropriate scheduling of operational time (Unit functions only in the morning, making it difficult for parents to bring their children due to career commitments).
2. Presence of laboratory work being carried out in the Unit.
3. Inappropriate utilization of nurses role (shortage of staff-nurses work as laboratory technicians).
4. Lack of space (space utilized by out-patients who seek laboratory work); 550 to 600 out-patients attend the unit per month.
5. Lack of patient education, interaction and communication (patients education is affected; they lose interest in their treatment plan leading to non-compliance, leading to recurrent admissions).
6. Patients find it difficult to cope with their treatment and schooling.

Alternative Solutions

Due to the wide range of the problem and limited prescribed time and resources, the team focused on the best solutions that would lead to the enhancement of the quality of utilization of the Unit. Since problems were associated with each other, i.e., customer satisfaction and effective utilization of Pediatric Day Care unit, their

strength, weakness, opportunity and threat (SWOT) are interrelated, and the following solutions were recommended for better management and control:

1. Restructuring of the work environment to encourage and reinforce patient/parent satisfaction and compliance.
2. Reschedule operational timing of the Unit to evening hours, i.e. 2:00 p.m. to 10:00 p.m.
3. Shift laboratory work for outpatients to the main Laboratory, ensuring nursing staff's commitment to their patients in the Unit.

Implementation

A pilot study of the proposed solutions was introduced, and on 1st January 2001 the recommended solutions were implemented. An evaluation study was carried out, and the resulting information indicated customer and personnel satisfaction. Recommendations for continuous improvement:

1. To consider other problems that were generated by patients that need to be resolved by teamwork.
2. We could have done better in the implementation phase by more staff training and keeping everybody in Salmaniya Medical Complex informed of the changes.
3. Social workers should have been involved in the team to ensure better approach and continuity of care in the community (especially for socio-economic assessment).

Other recommendations

1. Auditing should be carried out on an annual basis to assess quality and effectiveness of the change and utilization of resources in order to detect problems and any deviation at an early stage, to suggest qualitative solutions and teamwork.
2. Teamwork should continue to ensure continuous quality improvement.
3. To educate and train nurses to be good counselors because patients and parents need empathy and sensitive approach.
4. To develop a patient bill-of-rights policy in Salmaniya Medical Complex.
5. Promote and encourage active customer feedback as complaints act as a stimuli for health care growth and development, so that management get the tone and climate, so that mistakes can be learned from rather than concealed. Introduce a suggestion box to involve patients in the provision of care.
6. To introduce a better appointment computerized system and include the Pediatric Day Care Unit in the Health Information System.
7. Introduce better control and management in the Unit.
8. Arrange regular monthly meetings with key personnel in the Unit, involve patients/parents in the meeting to assess their satisfaction and encourage customer relations and teamwork.

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Salmaniya Medical Complex

Reducing the Admission Rate at Psychiatric Hospital

Introduction

Over the past 30 years the role of the Psychiatric Hospital in the care of those with long-standing mental health problems has declined to be replaced by systems of community care (Thornicroft and Bebbington, 1986). Present day health providers see an increasing number of chronically ill, poor and older clients in ambulatory settings. New trends of treating the mentally ill is moving towards community care services; and community nurses' home visits are considered cost-effective, as they will reduce the cost of admissions to the hospital, and therefore reduce patients' dependency on health care institutions (Moor 1974, Townsend 1988, Courtney 1987).

Problem Statement

According to WHO statistics 1% of the developing world's population suffer from severe mental disorders, while 10% have mild mental disorders. If these figures were projected onto Bahrain's population by the year 2000, it is expected that 3000 people with severe mental illness and 28,000 with psychosomatic problems would also need psychiatric care.

Our objectives focused on the rehabilitation and reduction of admissions rate among the psycho-geriatric and long-stay patients. Of the chronically ill patients who occupy 102 beds in the Psychiatric Hospital, 62 are geriatric and long-stay patients. The hospital also experienced a severe shortage of beds for acute admission patients. Long hospitalization of patients caused their stigmatization among the public and detachment of patients from their own environment and society, leading to social isolation.

Forces and Constraints

Among the main reasons behind the trend of admitting chronically ill, elderly patients are:

1) Rapid development of modernized social lifestyles, low economic status with limited housing facilities, changes from large extended families to nuclear families, and employment of most family members seeking to raise their economical status and standard of living. Constant development in health care services and knowledge of people reflects on increased life-expectancy rate among the elderly.
2) A large percentage of people under the age of 45 suffer from various illnesses such as diabetes, high blood pressure, cardiovascular diseases, etc., leading to their preoccupation with their own health problems and prevents them from caring for the elderly and mentally ill people.
3) Lack of communication between private and Government sectors also affects the families' rejection of the elderly, i.e if the Ministry of Housing provides housing facilities for families in the lower socio-economic status and if the Ministry of Labor and Social Affairs offers some financial assistance or domestic helpers for families in which all members are working. These factors, if resolved, will ease the load on families and the hospitals and will ensure proper care for the aged and sick within their own environment.

Implementation

A management team consisting of consultants, a chairman, doctors, nurses, psychologist, occupational therapist and social workers will put together a rehabilitation program initially for a five-year period, set objectives of the program and will follow-up on the implementation of a comprehensive rehabilitation plan:

1) No new admissions of geriatric patients should be encouraged unless it is done through the management team and based on established criteria and a commitment by family members to take patients home on completion of treatment.
2) Prepare a program, including Arabic language skills for expatriate staff involved in patient-care; identify Arabic speaking nurses for recruitment.
3) Prepare patients and their families for change as partners in sharing the program of treatment and acceptance, reinforcing good behavior in the form of token economy and orientation to the program.
4) Prepare for training in social skills, encourage integration into the family.
5) Encourage families to visit patients regularly, keep them abreast of news about members of their family, frequent short and long leaves, and initiate family education by community nurses and social workers.
6) Emphasize and support occupational therapy programs for long-stay patients.
7) Refer patients to community and day-care services, involve social workers in arranging activities with social clubs, other community services; prepare for small canteens, sponsored by donations to enable discharged patients to earn an independent income; contact private sector and societies to help in providing jobs and shelters for those patients.
8) Prepare an assessment tool of criteria to evaluate the eligibility of patients for partial or full discharge through cognitive and behavioral function of each individual by psychologist and other team members.
9) Financial and social aspects of each family should be evaluated by social workers.

Recommendations

1) An evaluation revealed little success after four months of implementation of the program. The management team considered it was too soon to evaluate at that stage and will continue to make periodic review of the plan.
2) Members must meet more frequently to enhance the progress of the program, annual change of the team and managers, and overall review of objectives and set up new ones if necessary
3) Assessment of social scale before and after the program is required.
4) Follow-up of discharged patients and continuous quality improvement program for those who are still hospitalized.
5) Maintain record of admitted and discharged patients.
6) Increase the number of community nurses and teams to provide more home visits of the elderly and chronically ill patients. Voluntary group/workers should be encouraged to visit and educate people in their community.

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Evolving Strategy for Rational Utilization of Laboratory Services in Salmaniya Medical Center

Introduction

Social, economic and technological changes have had an impact on the delivery of health care services and the ways in which clinical laboratories are equipped, operated and staffed. Clinical laboratories are being "re-engineered", "down-sized", "right-sized" and "restructured" to deal with the needs of the present era of intense change. Consequently, there is a greater need to initiate measures and implement strategies to develop an effective and efficient laboratory management system.

In the Kingdom of Bahrain, Salmaniya Medical Complex has instituted effective measures to automate laboratory services and develop a network of laboratory information. Laboratory services have made important contribution to patient care. When viewed from the perspective of patient records, laboratory information is often a sizable and critical component of quality health care. But when viewed from the cost-effectiveness point of view, a lot of inappropriate investigations were found. The reduction in the cost of care should include reduction in mal-utilization of diagnostic tools.

Problem Statement

Optimal health care should improve the quality of life, such as increased longevity, improved functional status, reduced morbidity and complications. The cost of care should also be positively affected. The reduction should include reduction in the total cost of episode of care, a reduction in in-patient length of stay, and reduction in unnecessary utilization of expensive resources/diagnostic tools. In practice laboratory can be over-utilized because it consumes laboratory resources, initiates expensive or inappropriate medical investigations of non-existent diseases; or mal-utilized because inappropriate testing not only incurs expensive follow-up testing, but leads to delays in needed health care. Annual reports indicated an annual increase of 14% in the workload of the laboratory services in the last decade.

Root Cause Analysis

This project/study is planned with the aim of evolving a strategy for rational utilization of laboratory services in SMC by taking steps to promote optimal utilization:

- To benefit health care.
- To evolve a consensus relating to time schedules for repeating of tests and guidelines for rejection of tests.
- To evolve modules in network for evaluation,
- To reduce the cost of care with reference to diagnostic and prognostic tools in laboratory service.
- To reduce time delay in re-investigation at tertiary care by utilizing available data at primary care services.

The team, which was constituted to evolve a plan/strategies, set out by reviewing and discussing the prevailing laboratory practices. Members concluded the following points:

- There is a practice of requesting tests without relevance to clinical information.
- There is a tendency to repeat tests already performed at peripheral centres,

leading to unnecessary increase in workload, expenditure on re-agents and time. Based on its findings, the team decided on the following measures:

1) Formulate a module with the help of HID to tabulate location-wise test results of patients for particular tests, for specific desired periods.
2) Formulate another module with the help of HID to identify daily, repeated tests for patients without relevance.
3) Fix a minimum time schedule for repetition of tests for prognostic purposes.
4) Consensus was developed to reject request cards for tests subject to guidelines:

- R1 - Request card is rejected as tests were requested without providing clinical information and or not signed with stamp.
- R2 - Request card is rejected as tests were ordered without relevance to clinical information.
- R3 - Request card is rejected as tests were ordered without following relevant time schedule interval after the previous tests.

Implementation

After evaluating repeated tests as per module developed on the basis of the team's suggestion vide supra and examining request cards, Cards not qualified for analysis were rejected in the Biochemistry section, and notes to that effect, along with statements of reasons, were sent to physicians concerned. Specific requests on the rejection slips from physicians with proper reasons were examined, and tests were performed in a few cases wherever it was needed.

Results

During a six-month period from June to November 2000, the study indicated that the rejection of requests for certain tests resulted in considerable savings, i.e., approximately BD29,612 per annum, in addition to savings in man hours. Steps in the direction of rational utilization of laboratory services started yielding monetary benefits that can be utilized for diversifying the requests for additional laboratory services.

Recommendations

Based on the study, the following recommendations are made to implement continuously to bring about quality improvement and optimal utilization of laboratory services for better health care:

- Introduce monthly medical audits to develop repertoire and relevance of tests.
- Introduce modified request cards.
- Ensure provision of clinical information.
- Introduction of nationality, blood group, Hb pattern in the computer as permanent information in patients' profiles.
- Introduction of e-request card, on-line physicians handbook.
- Ensure regular follow-up/updates on the steps taken towards rational utilization of laboratory services as a part of Continuous Quality Improvement.

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Salmaniya Medical Complex

Misusing of TRAMAL by Drug Addicts and Forged Prescriptions

Introduction and Problem Statement

While checking the prescriptions during my inspection rota in private pharmacies, I found that there were many forged prescriptions. Drug Addicts falsified these forged prescriptions for certain kind of drugs, i.e., TRAMAL RETARD 100 mg (TRAMADOL). It is a centrally acting analgesic of the opoid class, and relieves pain by acting on specific nerve cells in the spinal cord and in the brain. These nerve cells lower intensity of pain sensation, a natural function that is enhanced by TRAMAL Retard 100mg, which is intended to relieve moderate to severe pain. TRAMAL should not be taken with alcohol, sleeping pills, pain relievers or other psychotropic drugs that act on mood and emotions as acute poisoning can occur.
It should not be used while being treated for depression, nor should it be used to treat withdrawal symptoms in drug dependant persons.

The Aim of the Project

Our goal is to meet our customer satisfaction by delivering quality service by protecting their health from these drugs that become poisons if they are misused, by minimizing the number of forged prescriptions and to stop drug addicts from falsifying prescriptions.

Designation of customer satisfaction as a primary strategic goal for many organizations is one of the greatest challenges facing them. It requires aligning all the components (people, department and services) of these organizations to provide the best possible services to customers. Therefore our department (Pharmacy and Drug Control) mission is controlling all the drugs in Bahrain and provide good services to the people of Bahrain.

Prescription Forms in the Ministry of Health

There are four kinds of prescription forms used for dispensing drugs, which are:

1. The ordinary prescription form which is green in color and is in daily use for all kinds of medications. It is used in the morning for patients coming from out-patient clinics at Salmaniya Medical Complex.
2. White prescription forms are used for non-Bahraini patients for which they pay BD1/-
3. The Limited Private Practice (L.P.P.) is pink in color and is used for patients coming from the LPP clinics which are open in the afternoons. Patients pay BD4/- for a one-month supply of each item on it.
4. Health Center prescriptions are yellow in color and are used for patients visiting health centers, and they will be dispensed only in those health centers.
5. Prescription forms for controlled drugs are pink in color. These prescriptions are used for controlled drugs, e.g., Narcotics written by doctors in private clinics and hospitals. Each doctor has his/her own prescriptions book, with serial numbers that are registered in the Directorate of Pharmacy and Drug Control, and each prescription issued from this prescription book also has serial numbers. These prescriptions should have full information about the patients to whom it is issued, e.g., full name, address, doctor's name, doctors signature and his stamp.

While dispensing this kind of prescription by pharmacist in private pharmacies, the patient's Central Population Registration Number (CPR) or the name and CPR of the person who comes to dispense the prescription, should be written on it. The Drug Inspector will check these dispensed prescriptions by the pharmacist. It will be rechecked by another pharmacist from our department while checking the Controlled prescriptions book. So there are double-checks of these kind of prescriptions, which means that nobody can forge of falsify them.

Prescription forms in Bahrain Defence Force (BDF) Hospital

Two kinds of prescription forms are used in the BDF Hospital

- The ordinary prescription is white in color and is used for all kinds of medications and should only be dispensed in the hospital.
- Controlled drug prescriptions are white with a red line and is used for dispensing drugs under control.

Why drug addicts falsify prescriptions for TRAMAL

Listed in the precautions for using TRAMAL Retard 100mg were:

- Patients with a tendency towards drug abuse or dependency take TRAMAL Retard 100mg only for a short time and under strict supervision.
- If alcohol or other drugs, which also depress brain function, are taken together with TRAMAL Retard 100mg, the side effects of TRAMAL Retard 100mg on the brain may be intensified. Addicts therefore abuse it by using high dose for a long time to affect their mood and emotions.

Who are our customers?

1. Internal Customers:

- patients
- members of the public (community)
- Private pharmacies
- Doctors

2. External Customers

- Services (MOH and BDF)

How do we discover the forged prescriptions?

During inspection visits, we check all prescriptions for controlled drugs dispensed by checking the following information:

- Doctor's name, Doctor's signature and his stamp
- Patient's name and CPR#
- Name of the Drug, the dose and the quantity of drug dispensed
- The CPR of the person who will dispense the prescription
- The dispenser's signature and pharmacy stamp

Root Cause Analysis

1) Doctors

i) Lose their stamps without informing the administration of the hospital or the Directorate of Pharmacy and Drug Control.

ii) They will stamp a number on the prescriptions without writing anything on it, and then they will lose it.

iii) They give their stamps to nurses to stamp a number of prescriptions for the patients before being seen by the doctor, so as to be ready.

iv) Some of the doctors write the drug for the patient who asked for it without examining the patient or knowing what the drug is used for.

2) Pharmacists in Private Pharmacies

i) They will dispense the prescriptions without checking it.
ii) They will dispense prescriptions without asking for the CPR of the patient or the person who came to dispense the prescription.
iii) Some of the pharmacists do not know the doctors' handwriting or signatures.
iv) Carelessness of pharmacists for not rechecking the prescriptions and the circulars from the Pharmacy and Drug Control Directorate. Warning letters will be given to pharmacists.

How We Solved the Problem

- I first met with drug inspectors and discussed the problem of the forged prescriptions for TRAMAL Retard which I had found.
- We informed the Director of Pharmacy and Drug Control about the forged prescriptions and explained the case to her.
- Our Director sent a letter to the concerned doctors and asked them if the prescriptions are genuine or not, asking if they wrote these prescriptions or not.
- After receiving the doctors' replies saying that they did not write those prescriptions, we still found forged prescriptions in private pharmacies.
- We send a circular to private pharmacies not to dispense any prescriptions containing TRAMAL tablets from the concerned doctors.
- Warning letters were sent to private pharmacies that dispensed forged prescriptions without checking them.
- After taking the above steps to solve the problem, we still found forged prescriptions in the market from different doctors.
- Drug inspectors again met with the Director and some pharmacists from private pharmacies, as a team and discussed the problem. We concluded that TRAMAL Retard 100mg must be dispensed on prescription forms for cotrolled drugs instead of the ordinary prescriptions.
- Our Director wrote to the Undersecretary and to H.E. The Minister of Health requesting a decision to be made for TRAMAL Retard 100mg and accordingly, Ministerial Orders #2 for the Year 2000 was issued by H.E. The Minister.
- We distributed the above Ministerial Order to all private pharmacies so that TRAMAL Retard 100mg would only be dispensed on prescription forms for controlled drugs.
- By application of the above decision in all private pharmacies, we solved the problem; and we did not receive any more forged prescriptions for TRAMAL Retard 100mg.

Why We Use the Prescription Form for Controlled Drugs

- The prescription form for controlled drugs book will be issued only from the Directorate of Pharmacy and Drug Control.
- These kind of prescriptions cannot be forged or stolen easily.
- Each controlled prescription book has a serial number, and each prescription form in it also has a serial number.
- Any doctor who needs these controlled prescription books must apply for it, and it will be registered in his name.
- In case of missing or lost prescriptions, the doctor should inform the Directorate of Pharmacy and Drug Control immediately. A circular will be sent

to all pharmacies not to dispense the missing prescriptions by the serial numbers.
- Every special control prescription will be checked by the pharmacist before he dispenses it. The drug inspector will check it again after dispensing it, and it will also be re-checked by the pharmacist supervisor.

Team members

We can achieve quality by incorporating teamwork. As we studied in our course, it is important to use cooperative efforts instead of individual efforts. We worked as a team involving all the drug inspectors, pharmacists in private pharmacies and some of the doctors concerned. For the team to work effectively, they should clearly define the problem before moving to solutions. Team process is also extremely important in determining the quality of the final product. Accordingly, all drug inspectors worked at the same time, together with pharmacists in private pharmacies, to check and recheck all the prescriptions, in order to reduce the time needed for checking the prescriptions.

Reasons for Selecting These Alternatives

- Minimal or no forged prescriptions
- Highly practical
- Higher rate of reliability
- A process that ensured accountability
- Sharing workload
- Reduce time consumption
- Less complication in the process

General Recommendation

1. Documentation of errors can be used to give constructive feedback to improve the dispensing process of the forged prescriptions.
2. The inspection process for the prescriptions should be revised periodically (every year) to ensure its efficacy and to introduce changes whenever needed.

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Pharmacy and Drug Control Directorate
Ministry of Health

A Plan to Improve the Pharmacy and Drug Control Unit at the Ministry of Health

Introduction

Bahrain started drug legislation and regulations in the fifties. It was the first Gulf State to regulate the import and use of drugs in hospitals. The first local community pharmacy opened in the thirties.

However, for various reasons the pharmacy section in Bahrain was stagnant for some time and lagged behind, while other Gulf States moved steadily in the field. It could have been management ignorance about the importance of the profession, along with the lack of pro-activity among senior pharmacists who did nothing to correct the problem.

When I was promoted as Director of Pharmacy and Drug Control in July 1993, I found a situational problem in pharmacy services which I attributed to the following factors:

- Attitude of pharmacists who were in charge of the section.
- Communication and flow of information in that section was almost absent.
- No short-term or long-term planning.
- Staff were carrying out day-to-day work without clear goals and objectives.
- Lack of participatory spirit.
- No formal training courses.

It became my priority to improve the atmosphere in the directorate, to encourage team-work to achieve better decision-making and planning, using the five most important factors on the success list: pro-activity, planning, participation, time management and effective decision-making.

Pro-activity: Taking initiatives and value-based choice, or response are traits of proactive people. While they are still prone to their external environment whether physical, social or psychological, they have control of their responses.

Effective Planning is in knowing where you are, deciding quantitatively where this is possible, where you want to go and how to get there, deciding how far you can hope to go in achieving your target in a period of time, trying to get there in that time frame, regular evaluation on how far you have gone, why you are not on target, how you can do better in future and amending the implementation plan. The relationship between planning and goal setting is a fully complementary one and each affects the other. Planning depends on goal setting practices, good goal setting produces good planning which helps in future goal setting. It is very important to communicate goals with others in the organization. Operational plans are at the lower levels of the organization; we have a shorter time horizon and are narrower in scope. Operational plans are derived from a tactical plan and are aimed at achieving one or more operational goals.

Participative Leadership: An effective leader is one who, through interaction, influences individual and group behavior to reach the organizational goals. Effective leadership is a function of a complex combination of factors, including factors that are aspects of the broader organization and its environment, the traits and behavior of the leader, the leader's supervisor and subordinates. Giving subordinates a better chance of communicating with their leader, making it a two-way flow of information helps in relaxing the work environment and increasing performance. Incompetent managers create a difficult environment for their subordinates to work in, while effective participative leaders can add pace and energy to the work through empowering the work, which helps in motivating them to reach organizational goals.

Good Time Management: Pharmacy is a profession that entails continuous interaction between different professions, people from different walks of life and to expect many urgent problems to arise. An effective manager should set priorities, organize

and execute around priorities, schedule priorities, define key roles for a limited period of time, set goals to be achieved within this time limit and schedule time to achieve those goals.

Effective Decision-making is closely linked to planning and other management functions such as organizing, leading and controlling. To make a decision, a person should identify the need to make one before choosing, from different alternatives, the best one for implementation. When implementation of the chosen alternative starts, there is likely to be resistance to change, which should be handled through proper conditioning, unfreezing and freezing again after implementation of the change. Once applied, the results of the decision should be followed up on to evaluate its effectiveness. If the results are not satisfactory, the leader can adopt other accepted alternatives or may consider re-evaluating the situation over again, repeating the process.

The above mentioned success factors were stressed because of certain set up in the Pharmacy and Drug Control Directorate where the scope of work has increased dramatically, but there have been no written guidelines or clear policies and plans of action. I believe that

- Through pro-activity, we can improve a lot.
- Proper planning a clear mission of the directorate.
- Short-term goals could be identified and reached.
- Effective decision-making through participative leadership to motivate the staff of higher production, especially if the mission is clear.
- The atmosphere in the directorate should be more relaxed by changing to a more democratic leadership.
- Guided training will increase the maturity level of staff and will help in proper delegation, leading in turn to better time management or provide more time for planning, evaluating, revising and implementing.

Mission Statement

- I must set clear and achievable goals with clear target dates.
- I will work on yearly revision of the drug formulary.
- I will work on training technicians in oncology, quality control, poison and drug information.
- I will look for training courses and facilities for staff with particular interests which are of value in the mission of the organization.
- I will issue a pharmaceutical newsletter every month with all new references and information.
- I will initiate working on documentation of location, staffing and work procedures of the proposed new Quality Control Laboratory.
- I will review the procedure manual annually.
- I will ensure more organized contact with WHO, GCC countries and other international agencies to facilitate the exchange of medical information and regulations.
- I will revise the organizational chart.
- I will delegate more effectively to staff with good potential.
- I will give outstanding staff a chance to attend with me, or substitute for me, at useful meetings.

Ms. Layla Abdul Rahman
Director
Pharmacy and Drug Control
Ministry of Health

Improve Doctors Response to Nurses' Call in Medical Wards

Problem Statement

Approximately only 50% of the doctors respond to urgent nurses call to start intravenous fluid or to collect patients' blood in the medical department. Medical patients occupy about 234 beds in Salmaniya Medical Complex (SMC) excluding those who get admitted through Accident and Emergency (A/E) Department to other peripheral areas in the hospital when there are no vacant bed in the medical wards. Medical cases should get immediate assistance after admission and several investigations need to be done e.g., physical examination, blood tests, X-rays, etc. Usually medical cases admitted through A/E are seen by senior residents who plan the treatment/management, but other critical cases on mechanical ventilators need urgent care such as IV to be started/restarted, blood tests, etc., according to the doctors' instructions.

Nursing Administration in SMC has given orders that this should not be done by nurses unless put into writing and documented in the patients' order sheet. Sometimes nurses spend hours trying to call doctors on the patient's condition. By the time the patient may have missed the IV medication time or blood not collected on time, and the patient's condition deteriorates. The problem was discussed with the chairman of the Medical department and it was decided to keep records of doctor responses to nurses. The main objective of this exercise is to improve doctor response time in the medical department from 66% to 99%.

Root Cause Analysis

A team was formed from members of the medical and nursing departments to investigate the extent and causes of the problem and to review/discuss the issue with staff in their clinical areas. A list of causes was defined and a questionnaire was designed. It was decided to conduct a 1-day pilot study to test the validity and reliability after which the study was extended to 10 days, and it was found that there were 208 calls made from the 6 wards, Doctors responded to 138 (66%) calls and did not respond to 70 (34%) calls. The reasons for not responding were the following:

- Insufficient staff. Only two physicians were on call and had to cover more than one area.
- Physician was busy in the other side of the building (South Block).
- Physician engaged with A/E patient and cannot respond.
- Physician could not receive the bleep in certain areas.

Alternative Solutions

After reviewing the responses, the team decided to request the chairman of the Medical department to attend regular nursing meetings in the medical department to discuss to importance of the response where the policy and procedures of the Nursing Administration were emphasized. We also met with the CNS to consider training nurses on Level 5 on venosection procedures, but this solution was not supported by the CNS as she felt that this procedure was the doctor's role and would lead to extra work being placed on nurses. She also believed that this would lead to doctors being too reliant on nurses and would not respond if called to the wards and gave instructions that doctors who failed to respond to calls should be reported to

the nursing officer. The team felt that this was disappointing as the patient's welfare was important; and the delay in response could lead to severe complications, e.g., delay in collecting blood could lead to delay in diagnosis/treatment, delays in giving urgent medication/IV fluids, etc. These delays would cause patients to become frustrated, leading to loss of confidence in the entire medical management.

Implementation

The decision to do venosection needed authorization from the CNS who considered the extra workload being placed on nurses, but the team felt that the patient comes first - staff safety and policy are important, but not at the expense of the patient's welfare.

A meeting was held with the chairman of the Medical department who also convened a meeting with the doctors and concerned nursing supervisors, and it was decided that doctors should respond to the nurses' call on time. Doctors were advised to call the wards to find out the type or urgency of the request and to cooperate with the nurses, and an improvement was found in the responses of doctors in most of the wards.

Results

Although we failed in achieving our goals, we succeeded in accomplishing the minimum requirements of the task. We will continue to strive in meeting the goals of this project by meeting with and seeking the assistance of all the departments concerned to put the proposal into practice in the future.

Recommendations

- Doctors should continue to cooperate with the nurses and respond when called.
- Staff who have completed the venosection course should be authorized to implement the procedure in wards.
- This should be done in one or two wards at first to measure the effect and advantages.
- Nurses should continue to record the failure of doctors to respond to calls to compare the timing and required change.
- Patients should get the treatment at the right time, which in turn would lead to better satisfaction and confidence in the services provided.

Layla A. Rasool Esbai
Nursing Officer
Salmaniya Medical Complex
Ministry of Health

Services Improvement in Salmaniya Medical Complex

Problem Statement

A Quality Assurance Committee, represented by Administration, Nursing and Clinical Departments was established in 1990 but it did not make significant achievements. Neither did SMC gain any benefits from the Medical Review Unit that was established in 1991 as it did not fulfill its real role and obligations, and it was moved to a different organization in the Ministry in 1994. SMC administration is convinced that the problem of overcrowding in the outpatient clinics is attributed to the high percentage of follow-up patients. Patients whose conditions warrant being seen earlier by SMC consultants are kept waiting at present because we are seeing old and chronic patients who could easily be followed up at PHC facilities.

Root Cause Analysis

It was felt that an integrated team approach would make SMC better able to address its problems and initiate quality assurance; and the Services Improvement Board, chaired by the Chief Executive Officer was established with the following members: Chief and Deputy Chief of Medical Staff, Chief of Nursing Services and Administrators.

This project concentrates on one of the three task forces, the Out-patient Task Force Team, that was set up by using Belbin's guidelines in formulating a cohesive team with complementary knowledge, capabilities and expertise to evaluate the service. The cause-and-effect approach was adopted as a tool to determine the cause and extent of the problem. Along with brainstorming sessions with the active participation of the task force, several inspection visits were made to SMC Out-patient clinics in the main tower at different timings and on different days; and it was found that the clinics were overcrowded and disorganized during the peak hours of 8:00 a.m. to 12:00 noon. This was attributed to the following reasons:

- **Space:** layout of clinics, waiting areas and number of clinics.
- **Medical Records:** appointment system, retrieving of files and reception.
- **Shortage of Manpower:** doctors, nurses, clerks, security.
- **Policies and procedures:** timing of clinics, number of clinics/week and doctors' attendance.
- **Patients:** numbers and behavior/attitudes.
- **Numbers were further analyzed into:** number of walk-in patients, referrals from PHC, referrals back to PHC, and referrals from other organizations (ALBA, ASRY, Gulf Air, etc).

Deeming it necessary to prioritize the problems, the Task Force discussed the findings with the CQI Board and a number of staff members. Patient numbers was seen as the main attributor to overcrowding in the clinics. Comparison of monthly statistical reports issued by SMC Administration during the first quarter of the year 2000, revealed that while the difference was not very significant, what was noteworthy was the ratio of old to new patients in the year 2000, i.e., 72% old and only 28% new. These figures were worrying especially in a tertiary care hospital, which is supposed to treat acute patients, stabilize their condition and send them back to the referring health center for continuation of care and health maintenance. It is

worth mentioning here that the cost of an outpatient visit in SMC is BD 26.600, which is considerably higher than in PHC, where it is BD 2.500.
Instead they found that:

1) Some consultants were not convinced of the need to refer patients back to health centers.
2) There was no policy or forms for referral back to health centers.
3) Patients were reluctant to go back to the health centers. They were not aware of specialized services, i.e., diabetic and cardiology, etc., that were available at some health centers. Non-availability of medicines was another factor that contributed to their reluctance to go to health centers.
   Having identified the vast imbalance between old and new patients, the group agreed on the following goal: **the ratio of old patients seen at SMC out- patients clinic should be decreased from 72% to 60% by mid-2001.**

Solutions and Implementation

After a series of discussions with SMC Management, Administrative and Medical Boards and the Assistant Undersecretary for Hospitals, Assistant Undersecretary PHC, Director of Health Centers, Chiefs of Medical Staff, Chief of Nursing, and their counterparts at SMC, the following plan of action was endorsed and implemented:

1) Establish a policy and procedure for referral of patients back to health centers. Design a special SMC to PHC referral-back form.
2) Discuss the policy and procedure with the Management, Administrative and Medical Boards.
3) Strengthen communication between SMC and PHC regarding referral policy, continue regular evaluation of the plan and take corrective action.
4) Convince doctors in SMC on the need to implement referral back policy and follow-up through periodic review on patient numbers. Distribute the policy and procedure along with referral forms to all out-patient clinics in SMC and Health Centers
5) Improve the image of services offered at health centers so that it will gain the confidence of patients. Conduct patient education campaigns to orient patients on the new policy, and convince them of the merits of follow-up treatment at the nearest health center.
6) Coordinate with Directorate of Materials Management to ensure supplying health centers with necessary medications.

Results

Following the implementation of the new policy, members noted that there was a very slight decrease in the number of old patients, 72% in May to 69% in November 2000. A small-scale investigation was carried out to identify reasons for non-compliance, and it found two major obstacles:

1) A number of consultants and doctors were still unaware of the new policy.
2) Patients were reluctant to go back to the health centers.

As a corrective measure to the first problem, more copies of the referral back policy and forms were distributed to the clinics, and the Medical Board was requested to ensure that doctors complied with the new policy. A survey was carried out seeking patients' views on the new policy, for their comments or recommendations on this issue. The overall results showed that only 14% patients had valid reasons to be followed-up at SMC beyond their 4th visit while the remaining 86% could be satis-

fied with follow-up at health centers with some initiation from both SMC and PHC for the provision of medication and specialized health care at the health centers. If the number of patients drop from 72% to 60% by mid 2001 as per our goal, this will result in a potential savings of BD 59,302.

Recommendations

The objective of decreasing the follow-up patients at SMC should be pursued, and the new referral back policy should be enhanced. All indications and observations show that this goal could be achieved by mid 2001, with continuous efforts for improvement and strengthening communication between SMC and PHC by maintaining continuous dialogue.

This trend will strengthen our role as a secondary and tertiary health care facility and re-emphasize the role of health centers as primary, preventive and maintenance health care facilities.

Ms. Maha Al-Hamar
Chief Executive Officer
Salmaniya Medical Complex

Reducing Patient Waiting Time and Increasing Customer Satisfaction in the Radiology Department of SMC

Introduction

The Radiology Department at Salmaniya Medical Complex is comprised of many sections, i.e., Accident and Emergency (A/E), Computer Tomography Scanner (CTS), Magnetic Resonance Imaging (MRI), Nuclear Medicine (NM), Ultrasound (US), Angiography, special procedures and general examination.

Problem Statement

Following complaints from patients about the waiting time for registration and procedures at the Radiology Department, a survey was carried out in the department. The results revealed that staff spent 20 - 30 minutes and patients were spending about 30 minutes to 1 hour on registration procedures.

Senior managers supported the formulation of an effective plan to resolve the problem by using available resources in achieving the best quality of services at acceptable times. The objective of this project is to improve customer satisfaction by speeding up the registration process and reduce waiting time for patients requiring general and special Radiology procedures, without entailing an increase in cost or human resources.

Root Cause Analysis

Using fishbone analysis and brainstorming techniques, the team identified causes of delays in registration at the Radiology Department that were attributed to the following factors:

- Shortage of clerical staff.
- Distance between X-ray rooms and main office.
- Time spent in searching for lost or misplaced X-rays.
- Lack of equipment (bar-code scanners, printers, x-ray machines, etc.)
- Most staff take their break between 10:00 am to 12 noon, which is the peak period.
- Large numbers of patients.
- Staff resistance to change/unwilling/inactive.
- Lack of training, recognition or motivation among staff.

Alternative Solutions

Analysis revealed that while our strengths would allow us to continue to function at the existing levels of operations, there is great potential/opportunity to convert weaknesses into strengths, to work within existing human and material resources to achieve customer satisfaction for the services we provide. The team recommended the following measures for implementation:

1) Use the SWOT (Strengths, weakness, opportunities and threats) analysis as a tool in decision-making aid for new plans.
2) Reopen the old reception office that is currently being used for private (LPP) patients during the afternoon shift duty hours, as it is very close to the X-ray rooms and patient waiting area. This area could also be used for registration of special and general examination procedures.
3) When they are free, darkroom technicians should be encouraged to assist in registration and assign a hospital attendant working in Radiology Department to assist technician in retrieving old X-rays.

4) Encourage teamwork through active participation of Radiology Department staff in achieving goals. Keep them informed of existing problems and plans aimed at reducing patient waiting time.
5) Data collected from the 97 questionnaires dealing with most sections of the Radiology Department were successfully completed and returned and combined with results of random interviews of patients. Results revealed that while most of them were happy with the services provided by the Radiology Department, at the same time they were not happy with the waiting time.

Implementation

1) Unfreeze the current situation of registration in the old office. Teamwork approach is recommended for the new change, remove barriers and encourage teamwork through cooperation between clerical and other staff.
2) Messenger will be used to send the X-rays to the old office for distribution or X-rays will be given to the patient.
3) Analyzing the evaluation reports starts the refreezing stage. Suggestions will be taken from staff who work in the old office as well as patients, to initiate further changes if necessary.
4) Provide staff assistance/help desk facilities, telephones for patients in the waiting area
5) Continuous evaluation and monitoring of the workflow from the old reception office after its reopening.

Results

1) Effective teamwork, investigating errors, sharing of information/maintaining communication between staff and management revealed a remarkable level of achieving planned goals. An evaluation of the results of re-opening the old reception office revealed that we have been very successful in achieving the goal of reducing the waiting time from 30 minutes to 15 minutes.

2) Results of the new questionnaire, distributed after implementation, revealed a satisfactory reduction in patients' waiting time for general and special procedure examinations.
3) Efficient and cost-effective utilization of radiology facilities and manpower-radiology staff effectively cooperated in implementation of the plan and are happy about opening the old reception office.
4) The project, which was implemented from 22 July 2000, received complementary reviews and comments in the media on 9 August 2000.

Recommendations

1) Continued support for clerical staff from radiographers, technologists when they are free, and to assist them when there is a shortage of staff.
2) Recommend use of digital film that will further reduce patient waiting time.
3) Consider increasing the number of messengers, darkroom technicians and clerks to assist patients in finding old X-rays.
4) Provide clerical staff with small size printers for easy access, enabling them to register and print labels to be fixed on the envelopes without having to move away from their desks.
5) Continuous monitoring and evaluation of feedback of workflow from this office.

Mahdi Hassan Al-Kulaiti
X-Ray Department
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Tonsillectomy: Reducing Cost

Introduction

Tonsillectomy procedure, i.e. removal of tonsils under general anaesthesia, requiring in-patient services, is the most common ENT operation performed in Salmaniya Medical Complex (SMC). The following table shows the percentage of tonsillectomy cases in comparison to 5 other most common ENT procedures done at SMC:

Procedure	1997	1998	1999
Tonsillectomy	**792 (23%)**	**765 (21%)**	**840 (23%)**
Adenoidectomy	713	734	791
Myringotomy	138	150	164
Grommets	145	184	163
EUA-PNS	194	136	106
Total	**3424**	**3508**	**3603**

Despite the increase in the number of Otolaryngologist consultants (from 3 at the end of the 1980's to 8 in 2001), the number of ENT beds has not increased and remains as 38 beds for in-patients and 2 beds for day-case patients.

At the end of the 80's, patients admitted for a tonsillectomy procedure used to stay for a period varying from 6-7 days. In the 90's this period had been reduced to 4-6 days and currently varies between 3-5 days (average 4 days). The updated cost estimation to the Ministry of Health (MOH) per patient for bed utilization is BD 110 and the cost per patient for a tonsillectomy procedure is BD 40-50, regardless of their length of stay in hospital.

Post-tonsillectomy hemorrhage is the major morbidity that concerns surgeons with international figures varying between 0.8-2.5% (these figures depend on how hemorrhage is defined and which investigator is reporting). An unpublished study conducted in Bahrain quotes a range of 5-6%, but we don't have any statistics about the timing of hemorrhage occurrence. Internet literature review shows a range of 0-6.8 hours for the primary hemorrhage, with the confidence interval of the upper limit is 5.2-8.4 hours, meaning that it is safe enough to discharge the patient after 12 hours of performing a tonsillectomy.

Many hospitals in the USA, Canada, some centers in the UK and some hospitals in Arab countries are adopting day-case tonsillectomy surgery (based on several studies and researches that looked at the safety of patients, the timing of hemorrhage and patient satisfaction towards these changes).

More than 70% of patients requiring tonsillectomy are children between the age of 2-10 years of age. Several studies have stressed that hospitalization of children for prolonged periods can lead to psychological impact upon and that needs to be addressed.

Problem Statement

By analyzing these facts, we conclude that the problems facing the department are:

1. Increased demands on the waiting list for tonsillectomy.
2. Increased demand on financial resources.

3. Increase in number of patients and consultants with no corresponding increase in number of beds.
4. Increasing the number of operating sessions to cover all consultants from 5 to 8 sessions per week has led to pressure and stress on staff, patients/relatives dissatisfaction, problems with bed availability, cancellation of operations, crowded nursing stations in the wards on a daily basis and deterioration in staff-patient relationship.

Commencing in January 2000, after being promoted to a Consultant, I have started my own list with the criteria of keeping patients in hospital for 2 nights only, i.e. day 1 is admission/preparation for surgery, day 2 is day of operation and day 3 is when the patient goes home - a total of 2 nights spent in hospital.
The team, consisting of 8 ENT Residents and myself, devised, implemented and standardized this protocol with the aim of continuous quality improvement and cost reduction, reducing the length of hospitalization for tonsillectomies from 4 to 2 days over a period of 20 months (Jan. 2000 - Oct. 2001).

Root Cause Analysis

The team used the brainstorming technique to generate ideas, find causes and solutions, explore problems and minute details, with one member keeping written records. The following are the results of the fishbone and pareto analysis:

1. The Procedure:
   a. Is it safe enough to be performed as an overnight stay or even a day-case basis?
   b. Lack of research and studies on the risk of hemorrhage, pain, nausea and vomiting.
2. Other Consultants:
   a. Lack of awareness.
   b. Concentrating on the risks and of losing ENT beds to other departments.
3. The Staff:
   a. Lack of awareness.
   b. Very low motivation.
4. The Patient's Relatives:
   a. Lack of awareness about costs, psychological effect on their children.
   b. Very low sharing of responsibility threshold.
   c. No education about the role of the parent.
5. The System:
   a. Lack of auditing system.
   b. Inefficient quality assurance system.
   c. Resistance to change to new policies such as bed utilization.
   d. No clear goals.
6. The Day-Care Unit:
   a. Very limited number of beds.
   b. Unavailability of efficient overnight stay program services.

Alternative Solutions

After gathering the information and details of the problem, the team was able to identify many different solutions to these problems:

1. **Expansion of day-case unit and provision of more facilities to the ENT Department:** This will be expensive, time-consuming and needing decisions from higher authorities, would require department policy change to use the day-

case unit for ENT procedures and requires a great deal of study/discussion.

2. **Overnight stay program:** Patients are admitted to hospital on the day of the procedure and discharged the following day (if their condition permits). This requires a great deal of awareness by the doctors, staff and relatives. It also requires the cooperation of the Anaesthetist in order to evaluate patients on the procedure day, that all hematological and radiological investigations are ready and trained staff to cope with such a policy. In fact, 17 (16%) of our sample patients followed this policy.
3. **Reduce in-patient services cost by reducing hospitalization of tonsillectomy patients from an average of 4 days to an average of 2 days:** We found out the incidence rate of developing post-tonsillectomy hemorrhage and the timing of hemorrhage at the same time.

The team adopted this solution, as we had collected good data on which to build the project and obtained good results; and it seems a reasonable policy for patients, relatives and staff although we have been faced with many restraining forces.

Implementation

The team decided to follow Lewin's model of unfreezing, implementation and refreezing. Since being made Consultant, I had the authority to make decisions, unfreeze the system and began to implement my ideas from Jan 2000. Using a teamwork approach, sharing my vision with others, promoting decision-making, reducing restraining forces, empowering others to act on the new vision and adjusting to any obstacles along the way, we were able to standardize the project of having patients hospitalized for 2 nights only (unless their condition requires otherwise).

Our results will help us consolidate more improvements and will increase the credibility of our project among staff and other consultants to promote change in the system.

Results

Based on data obtained from medical records for the 20 months of the study and comparing our results with the other 8 ENT firms, we found the average length of stay (LOS) for the whole department for a tonsillectomy procedure to be 3.6 days with a variation between 2.5-4.7 days. We did manage to reduce the LOS of our firm to 2.5 days for 105 patients who underwent tonsillectomy, but we have been unable to achieve our smart goal of 2 days hospitalization.

Post-tonsillectomy hemorrhage cases were compared with a previous unpublished study and found that the incidence rate was similar (5.7% in our study, 5-6% department study), with the timing varying between 3rd - 10th post-operative days. This indicates that the most likely cause for bleeding is infection in the fossae of the removed tonsil and means that minimizing hospitalization following tonsillectomy will not increase incidence rate of hemorrhage.

Although our firm had less patients/LOS when compared to other firms, we found the cost is similar in each firm. The total cost for all patients who underwent tonsillectomies is equal to BD 618,530 for 1,567 patients operated, of which our firm accounted for BD 28,490 for 105 patients. If other firms agreed upon the protocol of our project, we could save up to BD 107,394 per year as the following table shows:

No. of Patients - other firms	Actual LOS - other firms	Expected LOS - our project	Actual cost - other firms	Expected cost - other firms	Difference (20 months)	Difference (per year)
1462	3.6	2.5	BD 590,040	BD 402,050	BD 187,990	BD 107,394

Recommendations fro Continued Improvement

The team felt that the project should be continued as standard and plan towards establishing an overnight stay tonsillectomy procedure as the next goal. An audit system should be established every 2-3 months and the same principles could be applied for other procedures (adenoidectomy, septoplasty, antroscopy etc.). Residents and nursing staff should be educated about the audit system and the need to reduce hospitalization in order to reduce spending. More beds should be made available for ENT procedures, the day-case unit should be promoted and a survey should be done among patients and their relatives to reinforce the project.

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Quality Improvement of Breast Cancer Pathology Reports

Introduction

Reporting of breast cancer specimens creates a vital link in cancer patient care, as in many areas of anatomic pathology. Oncologists and surgeons depend on breast cancer pathology reports to provide them with specific information that help determine therapy and predict patient outcomes. Pathologists can enhance and accelerate the treatment plan by using the optimum format and content of such reports. Traditionally, pathologists use free text/traditional or narrative reporting style. Based on several studies, this style has shown significant disadvantages, and in contrast synoptic reporting was shown to be superior and highly recommended by clinicians. This creates dissatisfaction among surgeons and oncologists (internal failure). It also increases the amount of re-work that will have to be done to rectify the situation, which will lead to delayed reports and delayed treatment. This in turn will lead to patient dissatisfaction (external failure). Therefore, a quality improvement exercise was carried out in order to improve/rectify the situation.

Problem Statement

Traditional style breast cancer pathology reports at Salmaniya Medical Complex (SMC) are of poor scientific quality in many aspects:

1. Inadequate information, such information may be difficult to obtain at a later date.
2. Vague choice of words, reflecting lack of decision.
3. Long descriptive text, which is often not read thoroughly or misunderstood.
4. Some components of the investigative process are forgotten/not done, as it is not present in a checklist (synoptic) format i.e., immunohistochemical profile of tumor.

Our survey revealed satisfaction levels of less than 30% with traditional reports. The aim of this project is to improve patient care and clinician satisfaction levels to at least 70% or more.

Root Cause Analysis

A team was formed with members from the Pathology, Surgery and Oncology departments of SMC using Belbin's criteria. The team members considered the following as the causes of poor breast pathology reports:

- Unclear reports (20%) due to vague choice of words and unsure about the diagnosis.
- Inadequate information (70%) due to lack of checklist and insufficient data provided by the Pathologist.
- Pathologists are used to old style of reporting and lack up-to-date knowledge.
- Specialized components of information are hidden/missing (10%) altogether due to lack of records and format is difficult to read.

Alternative Solutions

- Restructure reports in a standardized fixed format (synoptic/checklist style) with entries that must be filled in.
- Reports should be carried out as a computerized template, where secretaries

fill in spaces only, rather than typing in the whole text of the report.
- The computerized template of synoptic reports is applicable to all breast cancer cases.
- At the end of the synoptic report, there is always a "comment" component, where the pathologist has the freedom to describe in a free text format any unusual feature or any other special circumstances.

Based on the Driving and Restraining Forces, we chose to shift completely to the well-known internationally accepted synoptic style of reporting to overcome the persistent problem of inadequate information.

Implementation

1. Unfreeze: This is done by a series of lectures/seminars to increase awareness of the problem. This has led to readiness to change
2. Team members agreed on format of synoptic report according to international standards.
3. Coordinate with health information directorate to computerize this format as a template, and this format is used in all breast cancer reports (unfreeze).
4. Periodic evaluation of such reports. In this instance, opinions/inputs of surgeons and oncologists will be very useful in helping us upgrade our reporting.

Result

A total of eight questionnaires were sent to two oncologists and six surgeons, with only six replying (two oncologists and four surgeons) - a response rate of 75%.
The result shows 100% agreement by clinicians that there is often some key information missing in traditional style reports, which all agree that it is not true for synoptic style report. The general satisfaction levels with the synoptic style reports was found to be more than 70% for all clinicians as compared to less than 30% satisfaction with traditional style reports for 4 clinicians (66.66%) and 30 - 50% satisfaction levels were found with 2 clinicians (33.33%). All preferred to receive synoptic style reports (100%) This is another powerful result supporting our success in improving the quality of breast cancer reporting. We found improved satisfaction levels of more than 70% in 66.66% of our customers. 100% of our customers also supported extending this style of reporting to include other common cancers like colon, bladder, prostate, etc.

Recommendation for Continued Improvement

Cooperation, communication and involvement of all concerned persons (Consultants as well as Residents) could lead to continued improvement and better result. Proper computerization (via HID) is another area for potential improvement, although it is not very flexible due to bureaucratic procedures. Continued re-evaluation of the situation should be done, and our customers opinion regarding change and improvement should be taken into consideration.

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Over-Utilization of Laboratory Services by Accident and Emergency

Problem Statement

The Department of Pathology is one of the largest departments of Salmaniya Medical Complex and carries out more that 3 million laboratory investigations every year. One of the priority users of the Pathology Department is the Accident and Emergency Department of SMC. The A/E physicians deal with patients with a wide variety of disease conditions which requires laboratory investigations prior to starting any treatment. This has resulted in the setup of a separate laboratory to deal with Emergency investigations, namely in the fields of Hematology, Biochemistry and Microbiology.

It has been observed that 22% of the tests requested by A/E physicians are thought to be unnecessary, which results in increasing the time to release a report, thus prolonging the stay of the patient in A/E. The Pathology Department wants to work with A/E to reduce this number to a minimum of 5% by the end of 1999 by increasing the awareness of physicians to use the laboratory facilities in an effective and logical manner to resolve the problem.

A study conducted previously for a period of one month gave the following results:

- No. of patients visiting A/E - 14,607
- No. of Laboratory investigations ordered - 12,583
- Hematology tests - 3,511 (27.2%)
- Biochemical tests - 7,605 (60.4%)
- Microbiology tests - 1,467 (11.7%)

It was estimated that the yearly costs of these tests would be:

- Hematology tests	- BD 247,092
- Biochemical tests	- BD 197,076
- Microbiology tests	- BD 44,316
Total	**BD 488,484**

Root Cause Analysis

The greater number of tests results in sharp decrease in cost-effectiveness and plays a role in laboratory efficiency. It was found that many emergency requests are ordered for reasons other than true emergencies, and physicians who ordered the tests often did so before doing a proper diagnosis of the patients' condition. This also contributed to the delay in treatment as many A/E physicians are not aware of the time taken to perform particular tests and patients often have to wait for hours before getting treatment.

It was also found that tests were often repeated when the patient was admitted to a ward, indicating a lack of communication between A/E physicians and consultants in the concerned wards/departments, despite awareness among the physicians of fixed departmental budgets.

The public also feels that it easier to go to A/E for treatment rather than the outpatient clinics, which in turn increases the number of A/E patients and in turn increases laboratory tests.

Solutions

After evaluating the root causes, some solutions were suggested:

1. Group discussions and exchange of ideas between A/E physicians and laboratory staff should be arranged to emphasize the importance of laboratory investigations and cost-effectiveness of tests to prevent unnecessary and over utilization of the services.
2. Specific laboratory investigation forms should be designed for A/E to prevent unnecessary investigations, and A/E doctors must justify their requests for specific tests.
3. Patients with hereditary diseases should be issued with an identity card specifying his/her condition that would help speed up treatment.
4. Proper communication between A/E and wards to prevent duplication of tests.
5. One-week orientation per A/E doctor annually to acquaint them with latest trends in laboratory medicine.
6. Non-Bahraini patients should pay for laboratory tests.
7. Monthly statistics from laboratory should be provided to A/E doctors to inform them about increase/decrease in number of tests.
8. Triage system to be conducted by nurses to evaluate patients' condition.

Implementation

Informing A/E physicians to curtail unnecessary testing and developing a format of proper utilization of Laboratory services. A one-week stat test utilization study was undertaken to provide guidelines for this project and future planning. Meetings were arranged between staff and representatives from the A/E and Pathology departments detailing the results obtained by the study, and it was decided to curtail unnecessary tests from 22% to 5% by the end of 1999. It was agreed to have regular meetings between the two departments to evaluate the outcome of the study and to formulate a new laboratory request form for stat tests to be used only by the A/E department. A/E physicians who ordered unnecessary test would be informed to desist, and proper coordination between A/E and consultants in the wards would be initiated to prevent repetition of tests. Meetings have been planned with committees, such as the Hereditary Diseases and Premarital Counselling committees, to discuss the issuing of identity cards to patients suffering from blood disorders who regularly attend the A/E department. A feedback system between A/E and the Pathology departments has been planned to evaluate the findings of the study.

Results

All samples referred from A/E for biochemical tests for a period of one week were analyzed based on the need for immediate management of the patient. Tests ordered by A/E were categorized as follows:

Item	Number	Percentage of total No. of patients referred
Stat requests with no clinical information	281	24.3
Stat requests with conditions that require no stat evaluation	181	22
Stat requests with conditions that require stat evaluation	358	43.7

It was found that out of 33 stat tests requested by A/E, 11 did not reflect true emergency state and 9 should not be considered as stat tests. The number of tests profiles at the beginning of the study was 5,803, which decreased to 4,759 at the end of the study - a decrease of 18%.

Conclusions and Recommendations

It was noted that an average of 8 stat tests per patient were ordered by A/E. A specific protocol should be formulated for A/E to regulate the order form and bring about cost-effectiveness and optimal utilization of stat biochemical tests. Refresher courses on stat biochemical tests for professionals in A/E is essential and tri-monthly clinico-lab discussions should be held to review the utilization of stat tests, bring about cost-effectiveness in management, improve lab efficiency and make available essential investigations for acute care patients to improve acute care and emergency management. The concerned ward doctor should order stat tests when the patient is admitted to the ward. Patients with hereditary diseases should be issued with identification cards listing blood groups, haemoglobinopathies, etc., to avoid repetition of such tests.

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Ministry of Health

Senior Doctors Notes For Newly Admitted Patients to the Medical Department At SMC

Problem Statement

An average of 20-25 patients are admitted daily to Salmaniya Medical Complex from various medical referral centers (A/E, outpatient clinics, private clinics, other hospitals, etc.). The admitting doctor is usually the most junior on the team, and he is the physician who will examine and note the patient's history, condition and prepare a plan of management which will then be discussed with his senior colleagues who will either approve or modify it appropriately.

Despite a circular issued on 17/11/96 by the Chairman of the Medical Department, senior doctors, for various reasons, often do not write a note in the patient's file that would show that the newly admitted patient was examined and treatment planned accordingly. This has an adverse effect on the care of the patient as it goes without saying that the more senior/experienced the doctor, the better the plan of treatment would be.

A pilot study conducted in September 1997 for three days revealed that only 60% of the patient's files had Chief/Senior (C/S) Resident notes in them on the first day of admission. This was further confirmed by a bigger study on admission to the Medical Department that included 100 patient files admitted in the 3rd quarter of 1997.

The main objective of this exercise was to increase the percentage of patients files with Chief/Senior (C/S) Resident notes from 63% to 80% in six months and a further 10% in the following six months. This would result in improved services, decrease in average length of stay with better patient management care, would serve as medico-legal protection and, last but not least, improve Junior staff teaching as a result of comparisons between Junior and Chief/Senior Resident admission notes.

Root Cause Analysis

A team was formed and conducted a retrospective study for Emergency Medical Admission for three days (21-23 September 1997). The study showed that out of 67 admissions, only 41 (60%) files contained C/S Resident notes. The team then randomly examined 100 patient files out 1,807 Emergency Medical Admissions from the period of 1/7/97 to 30/9/97 and found 63 (63%) files with C/S Resident notes and 37 (37%) without. The team then discussed and analyzed the reasons for not writing notes that were as follows:

- The C/S Resident had examined/discussed the plan of management with the Junior Resident/Intern but neglected to note it in the patient's file.
- The C/S Resident had discussed the case over the telephone with the Junior Resident/Intern, gave instructions and felt no need to note it in the patient's file.
- The C/S Resident was busy with other more urgent cases elsewhere.
- Too many time-consuming tasks/consultation in other departments/locations.
- Preparation for postgraduate examinations.
- Preparation for conferences, lectures, workshops, etc.
- Patients' condition was too simple and straightforward to warrant writing a note.

Alternative Solutions and Implementation

The team discussed these issues in brainstorming sessions, and it was decided to organize a general conference with all Residents regarding the importance of writing a note in every Emergency Medical Admission as it would:

- Raise the standard of care since a plan of management by C/S Resident would be better than a Junior/Intern.
- Medico-legal cover for team on call. The note would show beyond reasonable doubt that the best possible care available was provided to the patient.
- The C/S Resident note and discussion of the case with Junior/Intern is an excellent teaching opportunity.

A form was designed and distributed to the Medical Wards, and all Ward Sisters-Incharge were asked to fill that form during the period of 1 to 15 October 1997. The forms were collected daily and showed the number of C/S Resident notes in patient's files was rising. 159 files were examined out of 259 patients admitted in that period and showed that 128 (76%) files had C/S Resident notes and 31 (24%) did not. The concerned C/S Resident was identified and counseled to ensure they write notes in the patient files in the future. Random patient files check plan was announced which would take place for a few days every month. Another examination conducted on 1 to 5 November on 46 patient files (out of 104) revealed that 37 (80%) had notes and 9 (20%) did not.

Results

We found a remarkable response, with rising percentage of patient files containing C/S Resident notes in them - from 63% during the period of 1/7/97 - 30/9/97 to 74% during 1 to 15 October 1997 and then to 80% during 1 to 5 November. Random checking should be continued every month, and those who are negligent/hesitant should be counseled. Another general staff meeting to receive and give feedback should be arranged to motivate people towards achieving a 90% result at the end of 12 months.

Recommendations for Continued Improvement

This study should be expanded to include other major departments in SMC for comparison and in other Medical departments in the GCC area and elsewhere. The impact of C/S Resident notes on patient length of stay (LOS) before and after the study should be measured. The exercise would be more fruitful if A/E staff and Ward Sisters were more actively involved in the study, as they are the first to receive patients. Teamwork is vital to the study, as it would make the project "ours" rather than "mine", so as to motivate and encourage everyone.

Dr. Reda Ali
Chairman, Medical Department
Salmaniya Medical Complex

Improving Out-patient Services in the Ophtalmology Clinics at Salmaniya Medical Complex

Introduction

Today's health care environment is continuously changing and constantly challenged to respond to consumers' growing demands for good and standard quality of care. The Ophthalmology Department at Salmaniya Medical Complex (SMC) took its first step of doing the right thing by carrying out this project that is part of an ongoing complete quality improvement project. The assessment phase aimed at clarifying the current situation in the Ophthalmology clinics at SMC looking at the structure, process and outcome and accordingly trying to improve areas that need progress. The assessment phase was carried out during the period May - August 2000 using tools such as observation, questionnaires, flow charts, clinic workload/patient visits, missing records and brainstorming. Based on the result from the assessment phase, the main issue that the Ophthalmology Department needs to work on is setting clinical guidelines and standards, which does not exist now. The area I chose to work on is missing patient medical records on the day of appointment. I believe that by reducing the number of missing files, we will help patients lessen the waiting time and dissatisfaction.

Problem Statement

Based on a mini study I conducted over a period of three weeks, 11.3% of outpatients medical records were not delivered to the Ophthalmology clinics at Al Fateh Center on the days of appointment.

Root Cause Analysis

The group, consisting of members from the Ophthalmology Department, medical records, nursing and clerical staff, had three meetings. During the first meeting, we introduced ourselves and briefed the group about the idea of root cause analysis and the fishbone exercise. We also discussed the process of getting the patients' medical records from the filing section to the clinics, as well as the various policies pertaining to the same subject. In the second meeting, we tried to identify all possible causes of missing medical records of the patient on the day of appointment. The group decided to conduct a mini-study over a period of three days that aimed at identifying the actual causes of missing medical records and their percentage. The study was conducted on October 1, 3 and 4, 2000. A total of 31 files were not found on the day the clerks received them from the filing section (16 on day one, 7 day two and 8 day three). 11.3% of outpatient medical records are missing on the day of appointment due to unsystematic reception, inappropriate staff, appointments not organized and patients unaware of the procedure.

Alternative Solution

The team members discussed the results of the mini study and the fishbone exercise. It was clear that the major causes of missing files were problems with misplacement in the filing section and the appointment system. The team believed that assigning a messenger would be the best solution to tackle all other causes and reduce missing files. The messenger will assist in delivering the files to the clinics before the clinic

starts at 9:00 AM. We also introduced new procedures of requesting missing medical records e.g., Early in the morning, the clerks would check the daily patients' register for each clinic (consultation rooms) and fill all missing medical records names and numbers in a patient medical record request form. The messenger will then take the form to the medical record section and give the filing section enough time to search these files. The medical record section will subsequently send the located files to the clerk through the messenger.
The old system was for the clerk to wait until the patient shows up; and if the patient's record is missing, only then they will request it from the medical record people, which can cause waste of time; and the filing section will not have enough time to search for it.

Implementation / Results

We pilot tested our solution over a period of three days (October 14, 15 and 16). The clerk at the Ophthalmology clinics will fill the form and then take it to the medical records section. Around 9:00 one of the medical record staff will take the located files back to the Ophthalmology clinics. The success rate of this pilot study was 99%. Out of 35 medical records missing on these three days, all but one were located. Along with this study, we studied the causes of the missing files; and we got quite similar results to the one we conducted previously. It is likely that the percentages of located files may vary from one day to another. However, we strongly believe that the success rate will be high. The above outcome was achieved in spite of the difficulty we encountered in coordinating with the heads of concerned departments to provide the required messenger.

Recommendation for Continued Improvement

There is an overall need for restructuring and creating a total quality management system in the Ministry of Health. The Ophthalmology section needs to develop clinical policies, guidelines and standards as well as evaluation and monitoring tools. A quality improvement team is required to identify and investigate further the root causes of the issue identified in my assessment. The medical records office need to improve the filing system in order to avoid misplacement of files, and the SMC administration needs to improve the appointment system.

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Ministry of Health

Improving the Quality Control System of Drug Purchasing

Introduction

Quality in drug analysis is a primary strategic goal in the field of medical sciences. The quality of drugs reflects on the quality of services/products, and the drug quality control laboratory will ensure the healthy and speedy availability of drugs to patients. According to the basic guidelines set down by the World Health Organization (WHO), every state should establish its own Drug Control laboratory. WHO also recommended the appointment of an Advisor for the Drug Quality Control Laboratory. When the Directorate of Pharmacy and Drug Control was established, it gave impetus to setting up the Drug Quality Control Laboratory for testing of drugs and pharmaceuticals.

The Drug Quality Control Laboratory was then established under the Directorate of Pharmacy and Drug Control. A head of the Laboratory and four other staff members were assigned to the Laboratory. The Director of Pharmacy and Drug Control, accompanied by the Head of the Laboratory visited various laboratories in the region, and short-term training for the Head and staff was arranged at the Drug Quality Control Laboratory in Kuwait.

Problem Statement

The Director of Pharmacy and Drug Control received complaints on the effectiveness of drugs due to differences in drug levels or due to poor quality of drugs supplied by manufacturers. The Ministry of Health needed a facility for evaluating these products. A key factor was that the procurement of drugs was done through GCC and national tenders in bulk through the Directorate of Materials Management (DMM), in accordance with a general list of drugs. Bearing in mind that the budget allocation for drugs in 1999 was 3.6 million Bahraini Dinars for approximately 1100 products that were procured, there was an urgent need to evaluate products procured from generic product manufacturing firms whose Quality Control systems may not be as strict as required.

Aims and Objectives of the Laboratory

Recognizing the need to improve the process of drug analysis, its consequent registration and availability to consumers, it was decided to use all available resources to formulate an effective plan to achieve speedy analysis:

- To evaluate drugs prior to registration in the country, for Government supply/private pharmacies.
- To analyze drugs before issue to pharmacies in various hospitals by sampling at DMM level, since the majority of drugs are procured in bulk and provided though this channel.
- To attend to specific complaints regarding the quality of drugs.
- To check the presence of undisclosed medicinal products, like steroids, in cosmetics or drugs.
- Periodic evaluation of quality of drugs and the effect of storage conditions, for products available in pharmacies.
- The priority of closer evaluation for critical drugs like antibiotics, cardiovascular, endocrine, anti-epileptics, etc., keeping in mind the resources required for testing.

Root Cause Analysis

Since the Drug Quality Control laboratory is a new entity, it did not stock all required chemicals and reference standards. The average time taken by DMM for procurement of chemicals is three months, and it takes about 4 to 6 months for the Medical Equipment Directorate to process requests for replacement parts, causing delays and consequent registration and availability of drugs to customers. Analysis of the problem identified potential causes for delays in drug analysis as follows:

- Non-availability of reagents
- Long procurement procedures
- Budgetary constraints
- Non-availability of equipment and spare parts
- Lack of experienced staff for repairing equipment
- Shortage of staff (no assistants or secretary)
- Lack of reference standards and reference standards for related substances
- Non-availability of certificate of analysis
- Improper documentation
- Shortage of samples

Alternative Solutions

The following solutions were recommended in order to decrease analysis time:

1) Since most of the reagents/chemicals are non-stock items, manufacturers were requested to supply all required chemicals.
2) We decided to go through the method of analysis submitted by manufacturers for products that are already registered in the country and not yet analyzed. The same procedure will be followed for general products procured by DMM.
3) Manufacturers were requested to provide reference standards or secondary reference manuals along with samples, so that over a period of time we would be able to have our own standard inventory.
4) Reduce procurement time by allocating an annual budget for certain low cost consumables/supplies, to laboratory to arrange for direct procurement from vendors approved by DMM.
5) Availability of validated test procedures is essential, since the laboratory is only for quality control and not a research and development laboratory. It is proposed that manufacturers must submit properly validated test procedures that should be reproducible under laboratory conditions.
6) Since the laboratory is new and all required equipment is not available, we recommend using the Public Health Laboratory, the laboratories at the University of Bahrain, the Arabian Gulf University or the Biochemistry Laboratory at Salmaniya Medical Complex to conduct tests when necessary. Meanwhile, there will be a concerted effort to obtain maximum equipment installed, thereby reducing our dependence on other institutions.
7) To ensure that equipment does not remain out-of-service for want of spares due to the lengthy process of procuring spare parts, it is advisable to stock the recommended spares.

Project Timeline

June 2000 • Identifying the problem by the head and adviser for long term method of analysis.

July 2000 • Prepare a tabular chart to find causes of delay in analysis and submit a report to the Director of Pharmacy and Drug Control

August 2000	• Scheduled meeting with Directorate of Pharmacy and Drug Control, Head of Drug Control Laboratory, adviser and the Chairman of the Drug Importers' Society.
September 2000	• The directorate of Pharmacy and Drug Control issued a circular to the dealers informing them about the material requirements for drug analysis purpose.
October 2000	• Scheduled meeting between the Directorates of Pharmacy and Drug Control, Materials Management, Medical Equipment, the Head of the Drug Quality Control laboratory and the adviser to discuss the problem and take necessary remedial action.

Conclusion

Intensive meetings and implementation of new methods/system resulted in:

- A marked reduction in the time taken for analyzing drugs,
- Procurement of chemicals is now done at a faster rate and helped maintain quality management,
- Equipment requirements for the laboratory was given priority and a budget of BD58,000/- was allocated in the year 2000,
- Priority was given for registration for those manufacturers who submit all necessary documentation and material for drug analysis.

The three phases of the Lewin model were implemented (unfreeze, change and refreeze) in this project, which emphasized that forces for change were more powerful than forces for maintaining status quo. Attempts were made to remove weakening or restraining forces, and then on strengthening driving forces to manage this change.

Ms. Sawsan Moh'd Abbas
Directorate of Pharmacy and Drug Control
Ministry of Health

Reduce Waiting Time For Ultrasound

Aim Of The Project "Smart Goals"

To meet our customers satisfaction by reducing the waiting list of ultrasound by January 2002 from 6 months to 2-3 weeks. This will improve the satisfaction of both patient and physician as well as the Ministry of Health (MOH) authorities as this is in keeping with the new strategies. The physicians feel that they are powerless in this regard and dissatisfied, as the waiting list makes them liable at certain stages for legal prospective and malpractice should situations deteriorate. Team members were selected according to Belbin's team roles from the personnel related to ultrasound work in Naim Health Center (NHC).

Problem Definition

Too long waiting list is not acceptable in MOH strategies and is considered as an external failure. The need to monitor all waiting lists including Barium and General, reporting with separate team.

Root Cause Analysis

1. **Equipment and Space**
    - Only one ultrasound machine - Aloka 700
    - Only one room available for such procedure in NHC
2. **Management (administration)**

The authorities are aware of the scale of the problem, but could not achieve the right alternative solution due to lack of teamwork and analysis of the root causes.
It was based on getting more Radiologists to NHC - The Chairman of NHC radiology services insisting on getting more radiologists to do the examination. Now we feel that that a Sonologist can help as an alternative.

3. **People**

- Shortage of Doctors and they are overloaded with work.
- Sonologists who are listed for doing general radiography work feel less motivated because of non-utilization of the training they have undergone.

4. **Physician**

Some of the physicians are not aware of the importance of the problem solving examination as there is no time for routine ultrasound screening work that is not related to patient's problem

Threat

- The physicians may decide through the Chief of Staff of Primary Care to train their own physicians for ultrasound if we do not solve the problem.
- The increased cost of new machine.
- Sonologist were trained by practical basis only and not through recognized faculty. This may lead to medico-legal consequences in future, since it is not passed through recognized qualification.
- Since there is no recognized qualification in Bahrain for Sonologist doing general study, Sonologist are less motivated as they get one grade or step and cannot get above the existing grading. This may also lead to de-motivation in future.

Alternative Solution and Implementation

Using Kurt Lewin (1947) model for management change, the following stages were undertaken:

1. Unfreeze the current situation. Incharge has to make sure of the improvement of both quality and quantity of the ultrasound performed on patients.
   We have to increase the number of ultrasounds performed from three patients to 10 patients initially.
2. Shifting the Sonologist to Naim Health Center to do half-day ultrasound (7-10am).
3. Conduct a monthly meeting to assess the progress.
4. It is the responsibility of patients' clinical physician to insure that any medical imaging requested will provide the information necessary for the best management of the patient's illness. There are very few indications for routine imaging of healthy individual "Reference quality Control".

- In August, it was felt that radiologist should check the request to make sure that unnecessary cases are noted.
- In November, number of radiologists increased from one to three, which helps do the reports on time.
- The team is happy with the progress achieved in November because our goal was achieved ahead of the expected time.

5. Refreeze: the team felt that it is time to continue the implementation and maintain the changes.

Result

The project lasted over a period of 6 months (May to November), and we have achieved the following results:

- The questionnaire given to the radiologist to check on the quality shows that quality is good in most of the cases
- The redo cases are 1:15, which is considered a very good result taking into consideration that we do cases on portable machine and not standard basic machine.
- The radiologist is happy with Sonologist performance.
- The number of patients was increased to 15 after one month of the new system.

Recommendation

Patients and Physicians satisfaction are improving and also the quality of service; however we recommend the following for continued improvement:

1. The existing ultrasound machine should be changed with higher performance machine.
2. To conduct ultrasound courses in accordance with training scheme and based program preferably in collaboration with either the Training Department or College of Health Sciences. This in turn can improve the College income, as we know the high demand of such courses in the Middle East.

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Ministry of Health

Reduce Breast Engorgement/Fever Cases

Introduction

It has been scientifically proven that breast-feeding is important for the growth of babies and that it protects them from various potential diseases, fulfills their psychological and emotional needs and makes them feel the love and care that they need at this age. It is also very important for postnatal mothers to express breast milk to ensure continuous flow of milk and avoid possible health problems. This requires an intensive awareness program for mothers. As healthcare providers, we focus on customer needs and satisfaction, and continually strive for improvement of the quality of our service. I utilized my project to contribute to the improvement of the quality of services rendered to pregnant patients and postnatal mothers.

Problem Statement

Some of the delivered mothers experience breast engorgement and fever a few days after delivery. My research (May to December 2001) revealed that 54% of mothers complain from breast engorgement. As customer satisfaction and patient healthcare is very important to the hospital, we aim to reduce breast engorgement/fever cases to 5% by December 2001.

Root Cause Analysis

Keeping in mind the objective of my project I used Belbin's team roles as a guide to form a well-balanced team, with the qualities of the team members complementing each other. We conducted two workshops and produced a project plan, which outlined tasks, timing, responsibilities, milestones and project deadline. We also held a workshop to develop a questionnaire, which would be used to collect related information and statistics.

The task of interviewing patients and completing the questionnaire was delegated to team members, who were given the responsibility of collecting information from hospital wards that they were assigned to. We collected data from about 50 randomly selected patients on different days and from different wards. Patients were also contacted or interviewed a few days after discharge from the hospital. A special questionnaire was also designed to record the possible impact of shortage of manpower and equipment on patient awareness. The statistics collected were then distributed to team members and key contacts (higher management) for information. Subsequently, I invited my team to a workshop at which I acted as facilitator. Agreeing on workshop rules, we brainstormed possible causes of the problem and came up with a huge list, which was grouped into a manageable number of causes using the Fishbone analysis and Pareto chart :

- Ineffective milk expression methods
- Inadequate equipment
- No procedure in place
- No commitment by supervisors
- Communication barriers
- Doctor-patient relationship (no time, too many patients)
- Inadequate supervision
- Shortage of physicians and nurses
- Inadequate training

- Patients do not know how to express milk; they do not know that they should express milk

Statistics showed that 92% of patients were either not aware that they had to express breast milk or had little awareness. 90% of the nurses/supervisors indicated that shortage of manpower had a medium to high unfavorable impact on patient awareness as staff nurses and trained practical nurses were overloaded with work and hardly had any time to explain the importance of breast milk expression to patients and how it should be done.

Alternative Solutions

Having identified the possible causes of the problem and developing the Pareto Chart, we held a workshop to discuss alternative solutions. The project team and key contacts arrived at the following alternatives:

1. **Employ 4 additional Staff Nurses or Trained Practical Nurses (TPN):** This option should solve the problem, but the reality is that additional staff nurses or TPN's are seen as significant additional monthly/annual cost. Besides, additional manpower will require a long training period. Therefore, this alternative was disregarded.
2. **Provide additional Manual breast pumps:** Additional manual breast pumps are cheap and available in the hospital stores. Providing the wards with additional pumps will help, but will not solve the problem as nurses cannot always spare time to explain to the patients. However, this alternative was not disregarded.
3. **Purchase 4 video cassette players (VCP) for postnatal wards:** Considering the driving and restraining forces that the team identified, the third alternative was selected. This solution is simple and effective, but requires nurses to show their patients a ten-minute video that explains the importance of breast milk expression and shows them how to do it. On the other hand, it will save a lot of nurses' time that can be used to carry out other work.

As manual breast pumps were cheap and readily available in the hospital stores, all the wards were provided with additional required quantities as a quick fix. Before the selected solution was implemented, a pilot test was carried out in the antenatal ward selected for this purpose. A VCP was provided and the pilot ward supervisor, who was a team member, was requested to explain the agreed procedure to her nurses, making sure that the lines of communication were clearly defined and remained open during the pilot phase.

As recommended, the video based training/awareness sessions were given to all the ward patients prior to their release. A few days later, fifty of the same patients were called or interviewed by the team and the questionnaires were completed. At the end of the pilot phase which continued for three months, the team analyzed the data collected. The results were outstanding and were presented to key contacts.

Results showed that the level of awareness of milk expression of patients (mothers) increased from 8% to 94%. In other words, 94% of the patients were found to be unaware or had little awareness before the project, whereas 6% of the patients were found to have little awareness after the project. As a result of significant improvement in breast milk expression awareness, breast engorgement cases dropped from 54% to 6% , thereby achieving the project goal. Moreover, the perceived unfavorable impact of manpower shortage on breast milk expression of patients dropped

from 90% to 20% as a direct result of using VCP's, as it saved nurses' time required for the program.
Some patients claimed that they had forgotten most of what they had learned in the hospital, and this may explain why 6% of the patients were found to have little awareness after leaving the hospital (most of these patients also stated that they had breast engorgement after their release from hospital).

Implementation

Unfortunately, we have not completed implementation of the solution as VCP's were not provided to the other wards as yet. This is mainly due to underestimation of the time required to purchase and provide VCP's to other wards. However, we have completed unfreezing the situation.

Unfreeze: In order to unfreeze the situation, we had to make the wards concerned unhappy and dissatisfied with the current situation. This was done by involving them in the survey and by sharing the results. I also used fictitious figures for a few private hospitals to show them the big gap in the quality of service. This initially gave them a shock that was needed to melt the resistance to change. Almost everyone voiced commitment to work on improving the situation urgently. In order to stimulate change, we also used Kurt Lewin's technique to reduce the restraining forces. Results of the force field analysis were used to reduce the restraining forces and emphasize the importance of the driving forces. Additionally, the wards were very happy with the idea of using VCP's as it will save them some valuable time. I involved my boss and the key contacts throughout this project to promote the sense of belonging to the team and ownership of the project.

Refreeze: Unfortunately the VCP's for the remaining wards have not been purchased; but once the requested equipment is in hand and the solution is implemented, we intend to refreeze the situation to ensure that people do not go back to the previous situation, as shown below:

a) We have developed a detailed implementation plan.
b) The team will provide adequate support for the wards.
c) We will have well defined roles and responsibilities for the implementation phase.
d) We established and defined lines of communication to ensure that major issues are addressed immediately.
e) We will update management with all developments.
f) We will celebrate the success of the project.
g) Three months after implementation, we will do the same survey.
h) We will post results of the survey on notice boards.

Results

Data analysis and comparison of the situation before and after the project was carried out revealed the following results:

- Patient milk expression awareness: showed an 88% improvement (94% - 6%) in breast milk expression awareness.
- Patients experiencing breast engorgement/fever (postnatal): there was a 48% reduction (54% - 6%) in reported breast engorgement cases.
- Manpower shortage impacts availability of staff nurses and TPN's to explain the importance of breast milk expression to patients. After the project the general perception was that 70% improvement was achieved.

Recommendations

We need to familiarize ourselves with the procedures involved in buying equipment and how long this process takes - this will have allowed us to allocate adequate time for this task in the project plan. Team members should be shown how the project objective was related to the hospital's vision. More empowerment should have been sought for the team in order for them to be more effective, and the same survey should be conducted every six months to ensure continuous improvement.

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Salmaniya Medical Complex

Health Center Service Efficiency

Reduction of the Waiting For Orthodontic Screening Appointments

Introduction

Worldwide, people seek orthodontic treatment for a variety of reasons: for the improvement of masticatory functions, to solve speech and jaw joint problems and to protect teeth from traumatic injuries. However, 80% of orthodontic cases are treated purely for cosmetic reasons, and majority of those have relatively mild cosmetic discrepancies. Like the rest of the world, Bahrain has a tremendous community demand on orthodontic services provided by the Ministry of Health (MOH) to an extent that there is a drastic increase of the treatment waiting list in which patients could wait for 5 years to start treatment. Up to mid-2001, there was no orthodontic referral criteria for the General Dental Practitioners in the Health Centers; so all patients asking for this service were referred to the Orthodontic Unit at Naim Health Center (NHC) where cases were then screened and classified using an international index for prioritizing cases according to their need of orthodontic treatment (Index for Orthodontic Treatment Need-IOTN). Treatment is referred only for cases having IOTN grades 4 and 5 with cases of lower IOTN grades were given the choices of being placed in the treatment waiting list or seeking treatment in the private sector. Five categories of orthodontic treatment need range from no need (1) to very great need (5).

The Problem of the Project

Patients who need orthodontic screening have to wait for more than 7 months to be seen after being referred from the Health Centers. On May 2001, orthodontic screening appointments were fully booked till the end of the year, and additionally there was a waiting list of 58 referred patients without screening appointments. As the Head of Orthodontic Division at the MOH, I felt that this problem needed urgent attention, and I carefully formed a team under my leadership using Belbin's team roles as a guide to solve this problem.

Root Cause Analysis

Using brainstorming technique and Fishbone chart, the team members considered the following as the causes of long waiting for orthodontic screening appointments:

1. High number of referred cases.
2. Limited resources at the orthodontic division.
3. Unnecessary review of cases from the waiting list upon patients' request.
4. Orthodontists have to see patients without referral letters as recommended by top management.

Using Pareto analysis, the team members agreed unanimously that the main causative factor of the problem is the lack of orthodontic referral criteria, which led to hundreds of unnecessary referrals. Among 558 cases referred every year only 117 had high need for orthodontic treatment, which means that about 80% of the referrals were unnecessary. Therefore, the team felt that the project should concentrate mainly on controlling the number of referrals; and based on this, we felt that 75% of the problems could be solved. If this can be supported with more resources, such as having more clinicians to screen those cases, then a greater percentage of the problem can be solved (95%).

Solution and Implementation

- The main goal of the project: By January 2002, patients' referred for orthodontic care should not wait for more than 2 months for orthodontic screening.
- Other Objectives of the Project:
    1. To encourage active participation of Dentists in their patients orthodontic care in contrast to the passive role they played in the past.
    2. To improve the orthodontic services provided in the Ministry of Health through continuous quality control.
    3. To provide Orthodontists with more time to manage high need cases and provide them with a better quality service.
    4. The project will indirectly support the private orthodontic services by directing lower need cases to them.
- **The Methodology and Activities of the Project**
    1. Control the number of orthodontic referrals by classifying cases according to IOTN.
    2. Increase Human Resources by scheduling screening by 2 Senior Orthodontists with the aim of having no more than 150 unscreened cases by the end of 2001.
    3. Monitoring the capabilities of the Dentists in using the Orthodontic Referral Criteria. The team developed the Index for Referral Rating (AFIORR), an index to rate the capability of Dentists in diagnosing and prioritizing orthodontic cases using IOTN and consequently forwarded only high need cases (IOTN 4 and 5) for treatment in the Ministry of Health.
    4. Training and Support Services for the Dentists. A scientific lecture title "Orthodontic Referral Criteria, revisited" was presented to the Dentists, through which we established the urgency to change the current situation in concern to referring cases to orthodontics, and this was data-supported stressing that the major part of the problem was because we lacked referral criteria (defreezing). Then IOTN was presented in a very simple graphic pattern followed by giving an idea on how we intermingled AFIORR with IOTN to keep us and them informed about their performance in applying the referral criteria.
    5. A circular was sent to all referring Dentists appreciating their attendance to the scientific session and reinforcing the importance of following the referral criteria.
    6. Giving feedback to the team members regarding number of patients screened and the number remaining to be screened.
    7. The project has achieved the support of the head, Oral Health services from the start, and she was kept informed about the developments.

Result

Orthodontic Referrals for the Year 2001

2001	No. of Refered Patients	No. of Patients Screened in 2001	No. of Patients Scheduled for Jan / Feb 2002
First Half	332	260	72
Second Half	88	40	48
Total	420	300	120

1. In the first half of the 2001, there were no referral criteria and a total of 332 patients were referred for orthodontic care. When the criteria became effective on July 2001, the number of referred cases declined to 88 in the second half of the year (74% reduction).
2. By the end of December 2001, only 120 cases were left unscreened and those are reduced for screening in the first 6 weeks of 2002. Patients to be referred in January 2002 will have appointments for screening available for them in the second half of February 2002 (less than 2 months wait).
3. Part of the 120 unscreened patients at the end of 2001 are 72 patients from those referred in the first half of 2001; and due to contact problems and patients inconvenience, we only managed to schedule them in January or February 2002.
4. 40 patients out of the 88 referred during the second half of 2001 were screened and rated using AFIORR
5. 24 Dentists referred those 40 patients; 14 of them (58.3%) were excellent in applying the referral criteria, 7 were satisfactory (29.2%); however, 3 were unsatisfactory (12.5%) and no Dentist scored poor.
6. The average AFIORR for the whole group of referring Dentists was +0.72 (Satisfactory).

The application of the new referral criteria reduced referred cases by 73% and continuing with this system will reduce the referral rate from 588 to 180 patients per year. More training and feedback has been initiated to reinforce the new system with the small minority of dentists who scored unsatisfactory.

Recommendation

For continued improvement, we will be making sure of having more open discussions with the concerned people about the importance of not missing cases due to fear of being rated unsatisfactory and the difficulty they faced in its application and assure them that our support through help line will be a permanent policy and not just temporary. Another area, which we are working on at the moment, is to provide the Dentists with simple and clear photo-supported exhibits in Arabic to enable them to educate their patients and the parents on why referral is necessary or otherwise.

Dr. Abbas Fardan
Consultant Orthodontist
Naim Health Center
Ministry of Health

Improve Utilization of Premarital Counseling in Sitra Health Center

Problem Statement

In spite of the introduction of pre-marital counseling service in Sitra health center in Bahrain free of charge since 1993, the utilization rate of this service was only 7.8% in 1996. Prevention of genetically blood-transmitted diseases, especially sickle cell disease and thalasemia major, is one of the top future strategic plans identified by Ministry of Health to be addressed by year 2000. The genetically blood transmitted disease have major effect on health, social and economic on individual, families and communities. Patients who suffer recurrent crises most of the time need admission to hospital leading to absence from work or schools. Most of these patients are exposed to the risk of Hepatitis B or C or HIV each time they have blood transfusion. In 1985 all newly born in Bahrain were screened for genetically blood-transmitted disease. The result were: 11% sickle call trait, 2% sickle cell disease and 4% thalasmia major.

Root Cause Analysis

In order to know the cause of poor utilization of the service, we planed a quantitative research in form of focus group. We conducted two sessions for female and other two for male. Participants' age ranged from 18 - 27 years old. All of them know the importance of such service, that is to ensure healthy children. In their opinion the main reason for less utilization of the clinic was due to fear from negative results, which can lead to stigma. Other reasons were love marriage, uncertain of confidentiality, prolonged procedure, lost result of blood test, or doctors attitude and faith in God.

In spite of all reasons mentioned above, so far most of them believe that they are going to use the service before their marriage and stop any arrangement of marriage due to the risk of having sick child. This was unexpected and gave us good opportunity to promote safe marriage and discourage the risky ones.

Alternative Solution

Using brainstorming and further group discussion, we reached to an agreement on our goal, strategy, Driving forces, Constrain forces, and health messages.

Our goal is to increase utilization rate of premarital service in Sitra region from 7.8% to 25% by end of year 2000.
The following strategies are considered to achieve our objective.

- Health education through group discussion, lecture at school, etc. and organize campaign yearly starting Nov. 1998 using posters and banners.
- Improve the quality of service and ensuring availability of results.
- Promotion of the clinic by giving incentives to those couples who utilize the service.
- Involvement of the religious leaders who issue the marriage certificate.

We agree to stress five important messages to be promoted by everybody for their awareness.

1. Genetically transmitted blood disease can only be diagnosed through blood test.
2. Through premarital counseling you can find out the risk of having sick children.

3. To prevent sickle cell disease or/and thalsmia major, we have to allow marriage only between compatible couples (i.e. sick person married to normal and carrier married to normal)
4. Glucose 6 - phoststaes deficiency is not a serious disease; therefore, it is safe for both persons who have phoststaes deficiency to get married.
5. Risky marriage which can risk having a sick child.
    - Sick marry to sick will result 100% sick children.
    - Sick marry to carrier will result 50% chance to have sick children.
    - Carrier marry to carrier will result 25% chance to have sick children.

Implementation

We are using Lewin Model for the implementation.
We have two issues that need to unfreeze. The first is utilization of the clinic itself by the target group, while the other is to avoid marriage between couples that are at risk of having sick children.

To refreeze the change we need to improve the quality of service to ensure customers satisfaction. Reinforcing message to be distributed again through different members. Having healthy children is the most important reward, which can lead to refreeze the changes.

Result

Basic data before the implementation of the project are shown below.
The utilization rate of premarital counseling in Sitra Health center for the year 1996

Total Marriage	Total Users	Rate
469	37	7.8%

Percentage of abnormal results of those who attend premarital counseling in 1996

Total User	Abnormal Result	Rate
37	16	43%

Percentage of abnormal hemoglobin in Sitra Health Center in the period from Jan - Sept 1997

Total HB electrophoresis test done	Abnormal Result	Rate
433	16209	48%

Recommendation for Continued Improvement

Quality of service, patient satisfaction, communication, motivation, ownership of the project by everybody involved, time management and team's courage are recommended for improvement.

Dr. Amal Al Jowder
Head, Health Education Section
Directorate of Health Centers

Increase Utilization of Premarital Counseling Service in Muharraq Region

Problem Statement

Premarital counseling was introduced to all Bahraini citizens free of charge in 1993 in all health centers to reduce the incidence of genetically transmitted diseases such as sickle cell disease, thalasemia major and glucose six phosphate dehydrogenase deficiency which affects the health and socio-economic status of individuals and families in Bahrain. This project aims to increase the utilization rate of the service in the Muharraq region by 40 % in 3 years time from the present rate of 6%.

Root Cause Analysis

Comparing the number of married population in 1993 in Muharraq region as indicated in central and department statistics with those who attended premarital counseling service in Muharraq region, 6% of the target population did use the service indicating poor utilization of the service. Target population attitude towards premarital counseling service was studied through questionnaire to test their ideas and beliefs and ways of improvement.

Solutions and Implementation

Analyses of the questionnaires were studied and ways of improvement of the service were revised. It was found that people are not motivated to utilize the service because of lack of knowledge about service availability and important value of doing it. A committee was formed to put into action a tactical plan headed by MCH supervisor in association with other members from the health center staff. A national committee was also formed with members from Health Education department, MCH, Ministry of Education, Ministry of Information, Ministry of Justice, and other societies like blood-borne Hereditary Disease society.

The project was implemented throughout the country advocating utilization of the available service, and educational sessions were given in schools, university, mosques and other established organizations. Workshop on premarital counseling for the doctors and staff were encouraged. Education of the public about the service was main concern. Confidentiality of the results of the service was always emphasized; the fact that the service is not against religious beliefs was stressed through religious leaders in the community.

Results

Health centers statistics show encouraging results as more couples believe in the importance and benefits of the service, attending premarital counseling services throughout the country. The statistics showed that 25.3% of couples married in the year 2000 utilized the service.

Health Center	Total persons who utilized premarital counseling service (region 1)				
	1993	1994	1995	2000	total
Health Center	10	25	6	**41**	**82**
Sh. Salman	30	23	8	**38**	**99**
NBB	12	20	7	**43**	**82**
Dair	10	8	4	**84**	**106**

Recommendation

Premarital counseling service improves the reproductive life of newly married couples and reduces the suffering of affected families and progress socially and economically. It also reduces the economic demand on the services for hereditary blood disease, which requires frequent admissions and absenteeism from work.

The aim to reach 100% of married couple screening will soon be achieved through compulsory premarital counseling before marriage.

Dr. Bahiya Al Asoomi
Doctor in-Charge
Muharraq Health Center
Ministry of Health

Reducing Patients Coming for Unnecessary Dressing

Introduction

Al Razi Health Center provides primary health care for workers of companies registered with the Ministry of Health. It also provides pre-employment health screening for newly arrived expatriate workers in Bahrain.

Problem Statement

Everyday, we receive around 70 patients requiring dressings for different types of wounds in the mornings, around 20 patients in the evenings, and the average time spent on each patient is 8 minutes. This takes up a lot of time of the nurses as well as making patients wait for treatment. Some of the dressings were for minor wounds that did not require the intervention of the nurses and could easily be treated by the patients themselves. The table below shows the statistics for the morning and evening clinics in the year 2000:

Month	No. of dressings in the Morning	No. of dressings in the Evening
January	776	100
February	1062	238
March	898	176
April	901	126
May	1137	242
June	988	287
July	1047	196
August	1056	224
September	997	339
October	1256	267
November	1209	219
December	869	10

Solution and Implementation

A meeting was arranged with nurses in the department, nursing officers in the region, sister-in-charge and the doctor-in-charge of the health center. The aim of the meeting was to find quick and practical solutions to reducing the waiting time for patients coming to the health center for dressings. After discussions, the following solutions were offered:

- **Offering the patient dressing packs to use at home.** If the doctor examining the patient found the wound was uninfected and small, then the nurse would instruct the patient on the proper method of cleaning the wound, applying medication and dressing. The patient was required to visit the health center again after two or three days for the nurse to evaluate the healing process and

check for infection.

- **Refer the patient to the evening clinic.** This was suggested to ease the load of the morning clinic, as there are not many patients visiting the clinic in the evening.
- **Increase the number of nursing staff.** The nursing officer sent an extra nurse in the morning to deal with the extra load in the morning.
- **Health Education.** Explain the correct method of using antiseptics, the importance of keeping the wound clean and the proper way of dressing to the patients.
- **Offering airstrip/band-aid.** If the wound was small and clean and did not need special treatment.
- **Instruct the employer on necessary needs of injured workers.** To ensure that the worker does not re-injure or re-infect the wound.

The plan was implemented from September to December 2000.

Results and Conclusion

Using the above-mentioned solutions, we reduced the number of patients from 70 to 50 per day. We found no complications (infections, etc.) among the 20 patients that were doing home dressings. Reducing dressings saved time that was useful to providing better quality service to the patients.

Ms. Balqees Hassan Murad
Senior Nursing Officer
Al-Razi Health Center

Improving Dental and Oral Health Services

Introduction

The Dental and Oral Health Services Department carried out a survey to study the oral health status among the population of Bahrain covering randomly selected target groups, one of which was 6 year old children it revealed 86.7% of the 160 children that were examined were found to experience dental caries, where the level of decayed, missing, and filled teeth was 4.7 (Mustafa, A. and Alsamak, A. 1995) which indicated that a high percentage of children experience dental caries.
The aim of this project is to increase awareness of the problem of dental caries and ensure future prevention of the disease by tackling the issue from its roots before it reaches a higher level by developing a program for the parents of pre-school children.

Problem Statement

Dental caries cause extremely painful cavities in the teeth, which lead to abscess formation and swelling, when the stage of disease progresses and the only treatment that can be provided is extraction. Results of the National Oral Health survey indicated a high level of dental caries in deciduous teeth; 87.6% of 160 examined children aged 6 years have caries with the level DMF, 4.7, decayed = 3.9, missing = 0.5, and filling = 0.2, and confirmed that:

- The number of decayed teeth exceeded the number of filled teeth.
- Parents are not aware of the importance of deciduous (primary) teeth and problems arising from the early loss of those teeth.
- The frequency of sugar intake and its role in increasing dental caries is not understood.
- The use of cariogenic food and snacks between meals.

Keeping in mind that developing a program of a high standard and quality needs the effort of an effective, capable team, I used Belbin's Team Roles in forming a team enlisting six members with strong roles and experience in the field.

Root Cause Analysis

The team reviewed the results of the National Oral Health Survey carried out in 1995 that indicated the level of dental caries in Bahrain is high. Brainstorming the reasons and causes of the problem came up with the following indicators:

1) Adding sugar in the feeding bottles for infants and children put them at high risk for developing dental caries.
2) The intake of high quantities of sugar and unhealthy food and snacks by children.
3) The frequency of sugar intake is an important factor in increasing the severity of dental caries through continuous acid attacks formed by the oral micro-organisms. The following formula shows how dental caries are formed with sugar intake:
   Sugar + Bacteria = Acid + Healthy Teeth = Diseased Tooth (Dental Caries).
4) The type of curative service provided to deciduous teeth is not enough. The ratio of dentist to patient is 1:14,800 public dentist (Al-Samak, A. 1992).

Alternative Solutions

The team's deliberations focused on the following preventive measures:

1. **Fluoridation of drinking water in schools**
   Studies on the relation of fluoride levels in drinking water and urinary excretion indicated that the level of fluoride in urine is to its optimum level even though sources of water intake differs from ground, desalination plant and blended water (Al-Awadi, A. and Jose, A.S. 1988). This is related to food intake; and therefore, forms of systemic fluoride cannot be used in this study; and the use of 0.2% fluoride mouth rinse will only need to be implemented as a topical measure to reduce the progress of initial caries. Driving forces: cost-effective and all children will benefit from it.
2. **Referring patients to the dentist and pedodontist**
   Restorative care is rarely provided to primary teeth because the number of dentists is less than the demand from people. Driving Forces: public dentist can effectively treat children according to their needs. Restraining forces: availability of only one pedodontist in the department and the low number of dentists to cover population demand.
3. **Oral Health Preventive Program for pre-schools**
   Develop a comprehensive oral health program focusing on children aged 4 - 6 years, their parents and carers and involve dental hygienists working in health centers to increase people's awareness of the problem of dental caries in deciduous teeth.

Implementation

The group agreed on the following measures:

1) Develop a program for preventing dental caries for children aged 4 - 6 years.
2) Develop a health food policy for pre-school children as a preventive measure of dental caries.
3) Develop a preventive program using fluoride mouth rinse and education to increase awareness on the effect of cariogenic diet in tooth decay and prevention.
4) Increase the awareness of parents towards oral health, care for children through educational sessions, and conduct workshops for parents and teachers.
5) Conduct educational sessions for children; increase their awareness towards a healthy smile.
6) Emphasize the role of cariogenic diet in tooth decay and prevention.

Program Schedule

December 1997: Inform the Ministry of Education on the program and time schedule for implementation and arrangement for the pilot study.

January 1998: Meet with dental hygienists to discuss the new program and seek their opinion on implementation. Inform dental hygienists who will be chosen to carry out the pilot study and get visual aids and educational materials ready.

February 1998: Pilot study implementation in eight pre-schools selected from four different regions in Bahrain. We are planning to get the results of the pilot study on pre-school parents' cooperation, children's cooperation in the use of fluoride mouthwash, time spent to carry out educational sessions and the number of parents agreeing to use the fluoride mouth wash.

March to June 1998: Program implementation

Program Evaluation

First evaluation of the program will be carried out in October 1998 with the second evaluation in March 1999. In December, 1999 the following steps will be taken:

1) Survey on oral health status of 6 year-old children, analyze the results and compare the data with the results of the National Oral Health Survey carried out in October 1998.
2) Assess the changes in children's knowledge and attitudes towards sugar intake after 6 months of program implementation, a process that will be carried out continuously every year.
3) Interview parents on the effectiveness of the program, knowledge assessment and changes in children's behavior with sugar intake frequency 6 months after program implementation.

Recommendation

While I think the program was a well-developed one, the following would have helped in reducing resistance of the people involved in implementation:

1) Results of the survey should have been given to dental hygienists to make them fully aware of the oral health status among the population of Bahrain.
2) Since dental hygienists are involved in the implementation of the pre-schools educational program, they should have been provided with information on the new program and consulted on what modifications would be needed.
3) Involvement of other sections, such as the Nutrition Section, would have been helpful in developing a checklist for a balanced healthy diet for children to distribute to parents.
4) There is a need to develop a formal food policy to be implemented in pre-schools through the combined efforts of the Ministry of Health and the Ministry of Education.
5) Involve a representative from the Ministry of Education in the team's meetings and discussions for better understanding of the problem and easier implementation of the program.

Ms. Dina A. Rahim Baluchi
Dental Hygiene Supervisor
Dental and Oral Health Services
Ministry of Health

Reduction of Violating Prescriptions

Introduction

Isa Town Health Center was in operation for almost 20 years, and shifted to its new location at Sanad on 28th March 1998. In 1997 Isa Town Health Center served around 294,000 cases. This figure has risen to 325,000 cases in 1999. The average daily patients visiting the Health Center is around 400 in morning and 500 in the evening. While on weekends and public holidays the figure reaches 350 in the morning and 650 in the evening.

Problem Statement

Over prescribing of medicine is affecting the limited budget of the HC's pharmacy. A circular was issued by the Chief of the Medical Staff for Primary Care to limit prescriptions in the evenings and holidays to three days only. The monthly requisition is designed to last for a full month, but due to over prescribing, HC runs out of medicine and many supplementary requisitions are ordered. This in turn increases the actual expenditure of the pharmacy, as well as of the HC. 48% of prescriptions are considered violating the rule against prescribing more than three days in evenings and weekends. The objective is to reduce this rate by 50% by the year 2001.

Root Cause Analysis

To determine the causes of the problem we analyzed the prescriptions of June 2000 to detect the prescribing habits, doses and patients needs. The duration of study was from June 1st to June 30th and the results were analyzed.

1. The average days prescribed were seven days.
2. Most of the drugs prescribed were panadol tablets, moxal suspension, zantac and voltarin retard.
3. Cost of the each prescription that contains voltarin, moxal, panadol and zantac for seven days was calculated

The team analyzed the findings and the causes were found as follows:

1) Patients' demand
2) Patients and some doctors misunderstand the clinic's rule
3) Some chronic patients tend to stock certain medications
4) Shortage of certain items in other HC's
5) Staff's demands
6) The pharmacy staff does not have the capability to discuss the violated prescription with the doctor
7) Certain doctors have the habit of over prescribing
8) Lack of doctors monitoring
9) Doctors do not know the exact cost of medicine
10) Increase in population
11) Administration
    a Lack of monitoring
    b. Lacks follow-up of the administrative circulars.

Alternative solutions

From the root cause analysis, we have identified certain ideas that could be helpful in improving the situation, which are:

1) Monitor doctor's compliance with the circulars issued by chief of HC medical staff.

2) Pharmacy must play a dynamic role through providing regular feedback.
3) Remind doctors not to follow patients demands, and they must not prescribe chronic medications during weekends and evenings unless it is strongly needed.
4) Start a continuous educational campaign about the use of medications.
5) All prescriptions must be issued from medical records; everyone including staff and their relatives must follow this rule.
6) Create an overall network of information for primary care.

Results

The implementation of the new system has proven successful. Prescription violations declined sharply in the past few months. The average reduction in overall violations summed to 45%.

The overall violations and improvements were not the same for all clinics; tables were prepared to evaluate them. The average cost of each violated prescription is BD0.540. The total cost incurred by the violations for the month of June 2000 was BD3,909. The violation cost reduced to BD2,170 in November 2000 with a total saving of BD1,739.

Recommendations

1) The support of the supervisor is vital to make the project more effective.
2) Teamwork is essential in solving problems and continuous improvements.
3) Sharing decisions related to problem solving with the front line staff acting as motivation for them.
4) Collecting and analyzing data will uncover the real and hidden causes of the problem.
5) The project has shown success in a short period of time and proven applicable. It is recommended that all health centers operating in the evenings and holidays should consider implementing similar projects.
6) If the project is extended, we should consider the other side of the problem, which is prescribing more than three times. This will save time wasted on drug preparation as workload resulted from over prescribing. Further savings on costs of medication will be achieved.

Eqbal Rashid Al-Amer
Senior Pharmacist
Isa Town Health Center

Fast Clinic In Hamad Kanoo Health Center and Patient Satisfaction

Introduction

Quality of service to the consumers is the main issue of the Ministry of Health, and it should be provided efficiently and effectively. With the new strategic health plan directions (2002-2010), the importance of the primary health care services and its preventive role (empower the primary health care as being at the heart of health service provision in Bahrain to deliver comprehensive family health care to all age groups) was emphasized. Recently, a new service called the "Fast Clinic" emerged in the health centers, to solve the problem of long waiting list, shortage of staff, to reduce the overload of the physician and give enough time for chronic cases.

The fast Clinic aims to examine the simple cases, such as fever influenza, diarrhea etc., without recording in the patient file. Unfortunately, this service was not practiced according to the criteria set for it; and patients started complaining on the quality of the service, and even the staff were unhappy. I found that the operation people were straying away from the strategic plans, and there was also a misunderstanding of the role of the health center's board. This board is established to run the daily/internal issues and solve problems in the health center, in line with the goals and objectives of the Ministry. It encourages the decentralization, but staff were not able to understand the concept.

Problem Statement

Our aim is to reduce the overload and improve the fast clinic and stick to the proper appointment system with 7.5 minutes for each visit (currently 3 minutes in the fast clinic), set the fast clinic only as a contingency plan and improve patient satisfaction.

Root Cause Analysis

A team was formed from staff according to Belbin's team roles in Hamad Kanoo Health Center and a series of meetings were held where brainstorming technique was used to identify the root causes. 200 patients were selected randomly and interviewed to assess the current situation and their satisfaction, with another 200 to be interviewed after implementation of the selected solutions.

The results of the interviewed patients were as follows:

- The appointment finished within the first half-hour with overload patients who in turn convert the rest of patients to the fast clinic regardless of their condition.
- Scheduling of appointments is not organized. Currently, telephone appointments are scheduled earlier, so attending patients have to wait for the first available appoint or go to the fast clinic regardless of their condition.
- Clinic 2 and 3 finished earlier, which led to registering the patients to other clinics or fast clinic (opposite to the role/importance of the family physician).
- Patients lack awareness about the purpose of the fast clinic.
- Lack of criteria for the service provided (kind of treatment) in the fast clinic, leading doctors to offer differing treatment, such as refusing lab tests, x-ray investigation, etc.

- The clerk is filtering the cases in order to register them accordingly to the clinic, which is not his responsibility/role.
- Increased number of chronic cases in the area, contraindicating the presence of the fast clinic.
- If patient's file is not available in the fast clinic, doctors refer the patient to the pharmacy to identify their medicine, which in turn increases the workload of the pharmacy staff.
- Unavailability of file also causes difficulty for follow-up cases.
- From the blocks distribution for room 1, the mixed file blocks are not acceptable as there are no patients continuity and against the Ministry roles.
- Shortage of staff.
- Improper and unfair distribution of population and blocks to the clinics e.g., Clinic 3 with 24,757 patients, Clinic 7 with 7,201 patients.

Alternative Solution

The team studied the causes and identified a set of alternative solutions as follows:

1. Increase the number of doctors, which is unfeasible.
2. Increase the number of nurses. This is restricted by budgetary constraints, lack of training in filtration system, and unwillingness to take responsibility.
3. Reschedule the appointment system where the telephone appointments are switched with the attendance appointments.
4. Increase public awareness on the purpose of the fast clinic through health education and media.
5. Redistribute the blocks based on number of population and patients' attendance to the center.
6. Establish a chronic clinic for patients with hypertension, diabetics etc. These cases are a contraindication for fast clinic.
7. Run the clinics, as first come first serve basis; but this would not have support from higher authorities, as they prefer the appointment system.

It was agreed to implement solution 4, in parallel with solution 3 and continue/enhance number of staff/training.

Implementation

The best solutions were implemented, but we faced resistance to change from:

- Doctors who did their jobs with few responsibilities.
- Patients who felt that the redistribution would alter their family physician.

Things went smoothly except for some complaints about distribution due to culture and religion. All suggestions were welcomed from the staff and the patients. During the implementation, I worked in the registration office to explain the purpose of the fast clinic and help the patients to decide which clinic to go.

Result

This study started in May 2001 and finished in November 2001 with the main aim of minimizing the occurrence of the fast clinic and increase the patient satisfaction and improving the family physician program/policy by sticking to the appointment system.

The fast clinic was functioning every day (5 working days) before implementation, but only for an average 1-2 days after implementation.

Patients Distribution before implementation

Room No.	No. of Patients	Blocks
1	-	Any Block
2	14,544	913-917-934
3	24,757	902-906-908-910-918
4	12,861	904-912-922-935
5	16,764	914-916-924-928-933
6	10,551	920-921-925-926
7	7,201	915-919-923

Patients Distribution after implementation

Room No.	No. of Patients	Blocks
1	8,986	914-915-919-923
2	14,544	913-917-934
3	17,122	902-908-910-918
4	12,861	904-912-922-935
5	9,435	916-924-933
6	8,428	920-925-926-(Jaw Clinic)*
7	15,072	906-928-921

** Jaw clinic is in a distant area open three days/week for four hours*

*** The new distribution considered the administrative responsibilities for some doctors and patients' regular attendance.*

The table below shows the percentage patients satisfaction

Level of Satisfaction	Before Implementation	After Implementation
Strongly satisfied	10%	60%
Satisfied	23.3%	20%
Not satisfied	66.7%	20%

Even though the result did not reach the required level of satisfaction in some areas, it is hoped that any deficiencies will be improved in the future.

Recommendations

For further continuous improvement we need to:

- Provide training of staff at all levels.
- Encourage an open discussion and welcome any opinion or suggestion.
- Establish a chronic clinic.
- Review the performance of the staff and services.
- Develop a well-defined policy and criteria.
- Involve representation from the community in health center board.
- Enhance the decentralization of the health centers.

Notes

I am happy to say that two points from the recommendations had been converted to action which were opening a chronic clinic in Hamad Kanoo Health Center in December 2001 and starting proper decentralization in two health centers in Bahrain from January 2002.

Dr. Hala Sulaibeekh
Office of Plans and Programs
Ministry of Health

Improve the Utilization of the Telephone Appointment System at Al-Hoora Health Center 2001

Introduction

One of the goals of the Ministry of Health in Bahrain is to deliver essential quality and cost-effective services, with increased emphasis directed towards preventive and primary health care services. Patient satisfaction is one of the desired outcomes in any primary care setting, and it is widely acknowledged that patients' involvement in health care services and their opinion is necessary for the evaluation of health care.

Hoora Health Center, a Class B health center in Region 2, is one of 19 health centers distributed among different areas in Bahrain. It offers curative and preventive health care including maternal and child health care, pharmacy, laboratory, medical records and dental care for approximately 21,302 residents in the Hoora area. One of the services provided in the health center is the telephone appointment system, which allows patients to make appointments for the same day. Unfortunately, it was found that this system was not utilized efficiently.

Problem Statement

Improper utilization of the telephone appointment system created difficulties for patients and health center staff. Results of a study using a questionnaire revealed that although 72% of patients chose the telephone appointment services, only 25% of them were able to get the line. Those who could not manage to get their appointments by telephone had to come to the Health Center to register their appointments. The resulting delay in appointments meant that patients had to wait in long queues, stay in the health center, go home and return for their appointments or the patients did not show up for their appointments, often resulting in loss of time for patients who consequently complained through the media.

Data collected through the monthly outpatient statistics of Hoora Health Center from April 2000 to July 2001, revealed that only 13 to 15% of appointments were utilized through the telephone appointment system.

Project Mission Statement

To improve the utilization of the telephone appointment system in Hoora Health Center and to increase utilization of this system from 15% to 25%, by the end of September 2001.

Organization and Communication

I was coordinator of the team that was formed for this project. Six other members from Hoora Health Center were selected according to Belbin's team roles. Members were encouraged to participate freely in decision-making and planning, bearing in mind the goal to be achieved and the necessity and urgency for changes. During subsequent meetings the team discussed the aim and objectives of the project, reviewing data obtained from the questionnaire and monthly statistics.

Root Cause Analysis

We started off with brainstorming sessions; and using the Fish Bone and Pareto diagrams, the team identified several aspects of the problem such as resistance and lack of motivation among staff to change, uncertainty about the benefits of this service,

shortage of staff, workload on the clerk, time taken for registration of patients, doctor's complaints about delayed files, cost of the printouts, leaflets and posters, limited telephone lines, under utilization of telephone appointment system, small reception area and no place to shift the operator away from the patients.

From the following force field analysis, the team concluded that the driving forces to change are higher than the restraining forces; and the result in itself was the motivating factor for the team to implement the project successfully.

Alternative Solutions

- Assign one full-time clerk for answering the telephone and taking appointments.
- Add extra telephone lines for easier accessibility and better benefits.
- Upgrade the telephone appointment system with answering machine.
- To improve utilization of the telephone appointment system by developing an educational program through the media through:
    - Distribution of leaflets, illustrating instructions for utilizing the telephone appointment system.
    - Display posters/leaflets in different sections of the health center.
    - Ensure that every patient receives a leaflet with brief instructions from staff.
    - Health Education program.
    - Joint meeting with leaders of the community in the Hoora area (social welfare, teachers, members of associations and committees, etc.) to involve them in the plan and to facilitate communication between the health center and the community, encourage people to share and participate in health promotion achievement and emphasize the leading role of the health center in the community.
    - Advertising through various media.
    - Broadcasting recorded messages through the announcement system.

Implementation

After identifying the causes of the problem and studying all solutions, we started implementation by unfreezing, explaining the need to increase utilization of this service and by introducing systematic changes to staff such as:

- To increase patients' satisfaction, to save their time and effort, to decrease the workload and crowd in the reception area and also to increase the quality of service provided.
- Leaflets were distributed in all sections of the health center; posters were displayed in all sections.
- One clerk was assigned full time with special instructions to be given to patients taking appointments by telephone that:
  - They should arrive in the health center at least 15 minutes before their appointed time.
  - They can go directly to the nurse at the assigned doctor's clinic, and
  - Their appointment can be taken for the following day if so required
- We conducted an educational program to increase awareness of the people about the benefits of the new, changed telephone appointment system.
- Continuous communication between each team member and staff to ensure understanding of implementation and its progress.
- Finally, we refreeze the change implemented so that it becomes part of the daily provision of services.

Results

From data collected after implementation, we noticed that there was a significant increase in the percentage of patients taking appointments by telephone. While the percentage of patients making telephone appointments from April 2000 until July 2001 ranged from 13% to 15%, it increased to 17.4% in August 2001 and in September 2001 it was 20.4% indicating a marked increase in patient satisfaction after implementing the change. Members of the team felt great satisfaction with the results that were achieved in such a short period of time, and were motivated to get higher results in the future.

Recommendations

The success of this project has proved that teamwork and involvement of staff resulted in their willingness and increased motivation to improve other required areas in the health center services through the use of CQI. Unfreezing and freezing was running smoothly.

We recommended continuity in improvement to reach a higher standard of patient satisfaction and to evaluate the project by continuous monitoring and feedback from staff and patients. Increasing the number of telephone lines and staff would further enhance the improvement of the services.

Dr. Hanaa Al-Mahmood
Deputy in Charge of the Hoora Health Center
Health Centers Directorate
Ministry of Health

Improving Drug Prescription in Muharraq Health Center

Introduction

Muharraq Health Center (MHC) is one of four health centers in Muharraq and is the only one to open until midnight during weekends and holidays. It is staffed by around 60 employees and provides health care to 5,500 families (30,000 persons), distributed over 12 blocks and is classified as a Class "A" because it serves around 600 persons a day. The nature of work is mostly follow-up of chronic patients, emergency and semi-emergency cases. While evenings and holidays are supposed to be for emergency cases, patients requiring repeated prescriptions particularly from other health centers make the situation of controlling drug supplements very difficult and create drug shortages most of the time.

Problem Statement

The consumption of Diclofenac sodium injections increased by 23% from January to June 2000 in Muharraq Health Center. The process of ordering the medicine depends on rational use of the medicine; but in general, we make the indent once monthly, on the first day of each month.

Improper use of diclofenac sodium may result in adverse effects and some patients will not get the medication if stocks are finished. Increase in prescribing of the injections will utilize most of the nurses' time and increase their workload in the unit, making it difficult for them to concentrate on emergency cases. Overuse will result in exhaustion of stocks, overspending and increased costs, leaving the prescribing doctors with limited alternatives. In order to maintain sufficient quantity of the medication, the Ministry of Health may look for cheaper sources, which may affect the quality.

DATA

Consumption of the diclofenac Sod 75mg injections:

Date	No. of ampoules	Cost
1998	5,901	BD 341,785
1999	9,270	BD 536,918
1/1/2000 to 30/9/2000	7,200	BD 505,440

Root Cause Analysis

In order to look for the real causes of the problem, we started by analyzing the prescription of Diclofenac Sod Injection to detect prescribing habits, or prescribing behavior. Also patients' needs or demands were considered.

1. Patients' Demand

- Repeated visits due to easy accessibility and great demand for this injection from patients requiring rapid painkiller/pain removal.
- Good quality curative services are available almost free of charge.
- Some patients go to private clinics and then come to the health center to take the free medication.

2. **Equipment**
    - Lack of computerized information system that keeps track of patients' records.
    - Majority of evening prescriptions are for patients belonging to other health centers.
    - Evening, weekend and holiday treatment is not indicated on the patients' files. Doctors, therefore, have no idea of the patient's history to find out if the patient had the injection earlier or the number of injections they received during the last few days.
    - Only one register book for all types of injections is available in the injection room.
3. **Management**
    - Over-prescribing by some doctors in Muharraq Health Center.
    - Absence of management monitoring ad controlling of prescriptions for all types of medicines.
    - No accountability in case of mistakes, mis-prescribing or over-prescribing.
    - Control system for dispensing in the pharmacy is not well established and continuous. Feedback for prescribing doctors is absent.
4. **Regional Health Center**
    - MHC is the only HC that opens in the evenings on a daily basis until midnight, weekends and holidays for emergency and common cold cases.
    - Patients belonging/reporting to other health centers in the morning, come to MHC for injections in the evenings, weekends and holidays, while other health centers in Muharraq City are closed.
    - Shortage of the medicine in the other three health centers in Muharraq City or when the quantity of medicine finishes, all patients are shifted directly by their prescription to MHC.
5. **New Indications**
    - Recently Diclofenac Sod, injection 75mg is being used for many cases or diagnosis other than those indicated above, e.g. acute dental pain, biliary and renal colic, Influenza symptoms and dysmenorrea.
6. **The growth in the number of patients**

Alternative Solutions and Implementation

We met with all the doctors and informed them of the current trend of over prescription of Diclofenac Sod Injection that resulted in over budget consumption and the side-effects of medicines when they are used for prolonged periods. Doctors should be informed that treatment of influenza symptoms by means of Voltarin injections exposes the patient to anaphylactic reaction and causes fatal damage to some organs of the body. (Text book of Pharmacology, WC BOWMAN/M J RAND page (13.23). Teamwork was used to reduce resistance to change; and meetings with doctors were held to discuss and resolve issues, stressing the need for cooperation rather than competition.

The study following implementation, which included analyzing data on Diclofenac Sod Injection, revealed the following:

A) Requirements were given to all doctors at MHC during August and September that explained the need to reduce consumption of this medicine.
B) In October, the prescribing rate of each Doctor and the total consumption

of Diclofenac Sod Injections were checked.

C) The total consumption was 719 ampoules from 1st to 31st October 2000.

Result

Before implementation 919 ampoules were dispensed, after implementation consumption was reduced to 719 ampoules per month. The resulting reduction of 200 ampoules per month comprised the saving of BD 14,040 (22%) per month that in turn would result in savings of BD 168,480 per year. By saving injection room time, we could improve the quality of nursing service, which could be devoted to other emergency room patients.

Recommendation

This project will be more effective if the following recommendations are implemented:

1. Introducing centralized information system for the health centers.
2. Communicate the information resulting from this project to all employees in the health centers, inviting their participation by comments, suggestions and recommendations for alternative solutions.
3. Build a continuous feedback system.
4. Top management support must be continuously provided.

Hanan Abdul Hussain Al-Aradi
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Muharraq Health Center

Workload Improvement at Budaiya Health Center

Introduction

There is no doubt that Primary Care physicians are overloaded with the present situation (of five minutes consultation time per patient), in addition to working under stressful conditions created by the system which affects both the care-givers - health center staff in general, and the care-taker - patient. The expanded catchments area for Budaiya Health Center over the past fifteen years played a big role in the quality and quantity of the services. Unfortunately, the health center sometimes has to work with less than the minimal number of doctors, nurses and clerks, which increases the staff work load and stress. This project is an attempt to decrease the workload using available resources with some managerial skills.

Problem Statement

The number of patients being seen by the Primary Care physician on a daily basis is 65, and the scheduled time is five minutes per patient. In order to improve the quality of care, we need to reduce the number of consultations from 65 to 50, and to increase the scheduled time from 5 to 7.5 minutes. Results of a survey done in the summer of 1996 revealed that workload and the five minutes consultations are at the top of the doctors' concerns.

Scientific problem-solving was used through listing the main problems and the leading root causes and team members were selected using Belbin's team roles. Many options have been studied based on identifying the forces against possible changes.

Root Cause Analysis

The main reasons for the workload (of 65 patients per session per doctor on 5 minutes appointment basis) are:

- People are encouraged to utilize the free-of-cost curative health services. Suggestions to impose a reasonable fee for each visit would not only reduce unnecessary and frequent attendance rate, preventing abuse of the system, at the same time it would create difficulties for people who are in real need of the services. This was a decision to be taken by the higher authority in the Ministry.
- Patients queue up first thing in the morning and are assigned appointments on a first-come first-served basis. Though most patients make appointments by telephone, many come to the health center early in the morning and immense pressure is placed on physicians to see the patients early, leaving them relatively free later in the mornings.
- Lack of information/education: almost all patients, even those with minor problems, are seen only by the doctor, whereas community health nurses should be making appointments for premarital counseling, family planning and preschool examination, etc.
- Sick leave requests from patients.
- Shortage/lack of nursing support, lack of responsibility/job satisfaction among nurses.
- Shortage/lack of clerical support, delays in retrieving patients' files from record room.

- Excessive demand for drugs/medication, frequent patient visits, prescribing medication for extended periods in dealing with problems of elderly patients.

Alternative Solutions

The team decided to tackle the following problems:

1) The problem of doctor-centered services
2) The problem of nurse support
3) The problem of delayed files arriving from record room
4) The problem of time utilization for some consultations

Implementation

Starting from October 1997, a new system was introduced at Budaiya Health Center:

The objectives of the nurse station:

- To screen clients' different requirements on each visit and direct them accordingly.
- To ensure that all requested tests are carried out.
- To identify and direct to concerned consulting physician on each visit.
- Ensure time-effective consultation for both doctor and patient.

From February we started a new clinic for all acute simple problems (Acute Illness Clinic), which has recently been changed to Quick Consultation Clinic (QCC), its objective being:

- To provide fast medical services for those with simple or acute illness such as common cold, backache, abdominal pain, injuries, etc.
- To save patients' time and reduce the number of people queuing early in the morning.
- To give the doctors more time to deal with other chronically ill patients and those who need follow-up will be seen by the usual appointment system (7.5 minutes each), thereby improving the quality of care.

Results

1) The estimated workload taken on by the nurse station is 7%, while the doctors' load is 6%.
2) The doctor at the Quick Consultation Clinic will accommodate between 27% to 47% more patients than other doctors if the system is based on 5 minutes or 7.5 minutes per consultation respectively.
3) Staff are enthusiastic and cooperative in implementing changes.

Dr. Kadhim Jaffar Al-Halwachi
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Ministry of Health

Improving Laboratory Results Filing System

Problem Statement

Laboratory results play a very important role in the diagnosis of different diseases, and it is very important for the lab results to be placed in the patients' file when they have an appointment with their doctor.

Patients visiting Isa Town Health Center (ITHC) complain that they waste their time getting their lab results as staff do not have proper filing system and cannot locate the file. It is clear that this problem is also affecting lab staff and doctors as well.

Laboratory staff complain that 25-30 patients daily come to the lab to check their results which had already been taken to the clerk room for filing. They waste their time in making copies and leaving their main duties, time that could have been focused on the treatment of patients. The goal of this project is to ensure that 99% of laboratory results are placed in patients' files within two days after taking them to the clerk. The duration of this project is six months, starting from August 1998 until January 1999.

Root Cause Analysis

I studied the problem by visiting the clerk section daily and watching the process of filing lab results. As I followed this procedure, I found that several points had to be improved.

Shortage of clerk and staff caused delay in placing of some lab results. Laboratory results, which are not placed in patients' files, accumulated in a special file in the clerk room and questions are not asked as to why these results are not placed in patients' files. Incorrect patient addresses and wrong CPR information also cause problems for the clerk. Lab results of housemaids that are not yet registered in their family files also contribute to the problem. As per the system that was followed in the health center, all the lab tests which are done at ITHC lab should be ready by the end of the same day either urgent or not and the patients are told to collect them. Some of the patients' files are old and disorganized, and in some cases lab results are not in the correct place in their files.

Solutions and Implementation

By analyzing these problems and by group discussions we agreed on the following solutions.

To record all lab results and putting a date stamp on each result to know when the result was taken to the clerk for filing This will help us in our statistics and enable us to know how long it will take in the clerk section and when the results are returned to the lab and not filed. Clerk staff are asked to write on the lab result the reason why these results are not placed in the patient file before they return it to the lab. Patients should be told that they could come only after three days for results of tests that are not urgent. This will reduce the number of patients asking for their results and enable staff to concentrate on their jobs. For results that are done at other units like Salmaniya Medical Centre lab or Naim Health Centre and will take time to be ready, the patient should have an appointment with their doctors to ask when they can collect the results, which will ensure that result is placed in patient file. The lab department takes the responsibility of the new housemaid screening lab result.

The clerk in charge should encourage the clerk staff to file the lab result not later than two days and should follow this procedure daily. And in the absence of one staff, the replacement should follow the same procedure in filing results.

From beginning of September the implementation of the solution started. Basema the clerk in charge has played a very important role in the team. She distributed all the lab results daily between all the clerks and advised them to file the results as soon as possible.

- In order to unfreeze the situation we have to meet with all the clerk staff and convince them about the importance of filing lab results in patient file, not only for the concerned persons but most importantly for patients. All files should be well maintained and organized.
- To refreeze the changes we need to improve the service quality to ensure customers satisfaction.

Results

We started the project in August and in September and October we tried our plan. In November we gathered preliminary statistics data. Before this project, the number of patients who were coming to the lab for their results which were not placed in their files were 15 - 25 patients per day. By the end of October it reduced to 10 - 12 patients per day. Statistics from September to October are shown below:-

Month	No. of Results taken to the Clerk	No. of Results Not Filed	% Results Not Filed
September 98	977	100	102%
October 98	1,067	79	7.2%

From the above statistics we can see that number of unfilled results shows a 3% improvement.

Recommendation

Introducing a computer system in the health center will ensure efficiency in providing correct information (i.e. CPR details, etc.) and locating files. It would help to have a resource investigator assigned to audit manpower, cost-effectiveness and resources. Information and statistics on lab results filing in other health centers could help us review and improve our own system.

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Improve Utilization of Hamad Town Health Center Telephone Appointment System to Achieve 80% by the Year 2000

Introduction

Hamad Town Health Center is a Class "A" Health Center in Region 4, offering a wide range of curative and preventive health care to the residents of Hamad Town area. A Ministerial Order issued in December 1995 set up the Hamad Town Health Center Council, with the responsibility of providing efficient and high quality health care to the community.

In accordance with the Ministerial Order, the Council met regularly, starting out by studying the difficulties faced by the Health Center staff and patients, manpower requirements, population of the area and monthly statistics. The Council undertook the task of centralizing decision-making, encouraging team-based problem solving at all levels and making sure that staff were knowledgeable about up-to-date advances in health care procedures,

Strategic Goal of the Project

Improve utilization of the telephone appointment system at Hamad Town Health Center and to increase the appointment system by 10% annually to achieve 80% by the year 2000.

Root Cause Analysis

A meeting between the members of the council and groups of patients and health center staff was held to discuss their difficulties with the telephone appointment system. Problems that were highlighted at these discussions were as follows:

1. Appointments for child screening for minor procedures were given from the telephone appointment list.
2. Some telephone appointments were not deleted from the standard register book, leading to duplication of appointments for those patients.
3. Only one clerk handled the four telephones that were available for phoning in appointments.
4. Patients who phoned in for appointments were not fully aware of the information they should provide and took considerable time with their calls.

Improper utilization of the telephone appointment system created difficulties for patients who could not succeed in getting the appointment by phoning in. They had to come to the health center to register, wasting time waiting in long queues. Delayed appointments brought about angry reactions from patients, who resorted to airing their complaints in the media, bringing about negative publicity to the health center. The relationship between patients and health center staff suffered as a result.

Statistics revealed the dramatic increase in the population of Hamad Town. In 1991 it was 29,055; and according to the most recent report, it had risen to 44,575, which was a 53.4% increase. This resulted in additional burden on the health center services. The 1995 annual report of the Health Center showed that the average appointment utilization was 98.05%, MCH appointments comprised 13.2% of the total appointments, with 3.7% for procedures. The average number of appointments

booked by doctors was 0.65% of the total, while the average telephone booked appointments were 41.87% of the total appointments offered.

Operational Plans

1. Proper utilization of the telephone appointment system for patients calling by phone.
2. To make the different units at the health center (MCH, nursing) aware of their allocation of telephone appointment time.
3. Upgrade the health center telephone system; install answering machine.
4. To assign two clerks, who will be trained in handling the new system of appointments and in dealing with patients.
5. To design a special registration book which will avoid duplication of appointments. Distribute leaflets, posters and regular newsletters illustrating instructions for patients on how to use the telephone appointment system.
6. Develop an educational program by arranging for lectures at the health center and in schools.
7. Joint meeting with leaders of the community in Hamad Town and involve them in the plan. Encourage communication between the health center and the community; encourage people to share and participate in health promotion achievement. Establish a community health education committee consisting of members of the health center council, social welfare workers, schoolteachers, members of social associations and clubs as well as members of religious associations.

Implementation

The plan was implemented from May 1996 and showed encouraging results with staff and patient motivation, increase in patient utilization of the telephone appointment system, no duplication of appointments and improvement in patient-staff relations.

Monitoring and Evaluation

Despite the encouraging results on implementation, there are still difficulties caused by leaves/absences of clerks, as well as patients' ignorance of the health center system. The progress of the plan will be monitored and evaluated as follows:

1. The Administrator will ensure proper staff allocation, review patient attendance and will report to the chairperson of the health center council on a daily basis
2. Weekly progress review.
3. Monthly review of statistics with administrator and members of the council, to discuss achievements and difficulties.
4. Hold a meeting every six months with leaders of the community and welfare groups to review difficulties and suggestions.
5. Conduct a six monthly survey to evaluate achievements/difficulties.
6. Annual review of the appointment system utilization to assess, increase and modify the plan accordingly.

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Licensure and registration Office
Ministry of Health

Reducing Wait-For-Appointment Time in East Riffa Health Center

Problem Statement

One of the strategic goals of the Ministry of Health is to deliver essential quality and cost -effective services, with general agreement that an increased emphasis must be placed on preventive and primary health care services. There is increasing consensus and acceptance in the importance that is placed on the contribution of patients' opinions in evaluating health care and their involvement in health services in achieving desired goals and patient-satisfaction in Primary Care.
In East Riffa Health Center, health care providers were faced with a shortage of doctors, leading to complaints from patients that they have to wait for 2-3 days before they are examined by one of the doctors. Keeping in mind customers' expectations and needs, they thought of the problem as an opportunity for improvement. One plan was to start an Acute Illness Clinic in which patients will be seen the same day.

Bearing in mind that the output of a team is usually more creative than the sum total of individuals working separately, with the doctor-in-charge as coordinator, a team was formed to study and find ways to reduce waiting time for appointments. In this project a specially designed questionnaire, using different scales, was used as a tool to measure patient-satisfaction with consultations. The team intended to use the questionnaire for comparison, before and after introducing the new services.

Root Cause Analysis

Examination of the daily clinic appointment books confirmed the existence of the problem.
Two Hundred randomly selected patients were interviewed and filled in the questionnaire before introducing the Acute Illness Clinic and another 200 randomly selected patients were interviewed after the introduction of the clinics. Some of the causes are listed as follows:

1) Patients' lack of awareness and appreciation: patients require education/information.
2) Improve doctor-patient relationship.
3) Doctors felt that they should be involved in the decision-making process with more support from higher authority. In addition to their workload, there was a lack of incentive/recognition of their achievements. Absenteeism combined with training sessions, lectures and workshops resulted in less time for patient care.
4) Nurses require continuous education, building-up confidence in their abilities, and should be given more authority in carrying out their duties. Nurses were found to be lacking in training, willingness and teamwork.
5) Clerical staff attitudes and mistakes need corrective action. They have no clear job descriptions, no motivation or job satisfaction.

Alternative Solutions

1) Increasing the number of doctors was recommended but not feasible due to budget constraints.

2) Introducing nurse filtering, where nurses would examine patients and treat simple conditions. This was not successful due to the shortage of nurses, and some of them were not willing to take on this responsibility.
3) Another suggestion was to cancel the appointment system and run the clinics on first-come, first-serve basis; but this would not have support from higher authorities and may hinder the treatment of patients with chronic illnesses.
4) Starting an Acute Illness Clinic where patients without chronic illnesses, or patients with simple conditions will be directed by the clerk after registration to this clinic. At this clinic no blood tests or other investigations would be conducted and no seriously ill patients would be seen; they would be directed to the usual clinic. In this way, doctors in the acute clinic would be able to see a large number of patients, who will not have to wait for appointments. The clinic would also have a different doctor each day. The team approved this as cost-effective, as no extra staff were required. For doctors, it was considered as a change from their daily routine, while patients could not complain about waiting-time, since they would be seen on the same day. However, the important question was whether patients would be satisfied with this new service.

Implementation

The team met with health center staff, explaining the need to introduce this new service, seeking their understanding of the necessity of the clinic in order to improve health center service. They were provided with data and results of the patients' questionnaire. Realizing that involvement of staff at all levels would make them less resistant to change, the team communicated with staff at all times. Clerks were also trained by a member of the team in dealing with patients and on how to screen patients who would be directed to the Acute Illness Clinic or the usual clinic. A pilot study of the clinic was initiated for one week and results revealed that between 2-5 patients only were turned away without examination. Patients made fewer complaints after implementation and starting the Acute Illness Clinic. Two Hundred patients were interviewed based on the same criteria as before as part of monitoring continued progress of the project. The team encouraged open discussion with staff, listening to their ideas on implementation. Their suggestions included having two different timings for the clinic each day, while another was to run all the clinics as acute illness clinics. The team enlisted the assistance of one of the nurses in reaching the desired outcomes. Recognizing that training and education were important in implementing quality improvement, short training sessions on running the new clinic was conducted for nurses.

Results

The main goal of the project was to reduce waiting time for appointments. Comparison of the study before and after the introducing the new clinic revealed that 7.5% said that they had to wait for one day for their appointments, and there was no overall change in patients' satisfaction.

Recommendations for Continued Improvement

For further improvement, the team will study the possibility of starting other new clinics such as chronic illness clinics for patients suffering from diabetes, hyperten-

sion, etc., to reduce waiting time for such patients.
As part of evaluating the project, they will need to examine other aspects of patient-satisfaction, i.e., doctor-patient relationship, staff communication skills and performance criteria for existing health programs, developing diagnostic and treatment policies for different diseases, staff satisfaction and their impact on the quality of services.

Dr. Mariam Al-Shetti
Doctor Incharge
East Riffa Health Center

The Expanded Program on Immunization

Introduction

In 1974, WHO launched the expanded program on immunization to ensure that children all over the world are immunized against a range of vaccine preventable diseases. Since then, governments throughout the world have established their own autonomous national immunization programs. In Bahrain, immunization started in 1956 by giving BCG and in 1957 DPT. The National Expanded Program on Immunization was established in 1974. It applied the guidance of the Global Program for Vaccines and Immunization, i.e. immunization policy, meeting the target, disease surveillance, maintenance, training and injection safety.

The communicable disease section is notified of all EPI target diseases immediately. The projected disease reduction targets to be achieved in the 1990's are:

- Eradicate/eliminate Poliomyelitis and Measles.
- Maintain zero incidences of Diphtheria, Tetanus and Whooping cough.
- Maintain and reduce low incidence of Tuberculosis, Hepatitis B, Rubella, Mumps and Meningococcal Meningitis.

Problem Statement

The immunization coverage in Bahrain has progressed steadily and achieved 95% immunization for children in 1996. The coverage in the early 1990's has been successful in eliminating morbidity and mortality from the EPI target diseases. A group of concerned people was selected in Bahrain and a plan was formulated for increasing the immunization coverage by 3%, from 95% to 98% in Bahrain by the year 2002.

Root Cause Analysis

We set a lot of investigational tools to reach the possible causes on why the coverage is not reaching 98% or more. After observation, interviews and home visits, we had a set of restraining forces which are:

- People are not aware of the importance of immunizations.
- Some expatriates children are not immunized; and they are difficult to trace, as they change their residence frequently.
- In health centers the tracing of defaulters are not done to the degree we need.
- Improper registration of data related to immunizations.
- Private sector doctors are not participating in the campaign of the importance of immunization.
- Weak program for public education through press media.
- Some schools are not following preschool screening procedures that ensures completing the child's immunizations.

Alternative Solutions

To achieve the 3% increase on immunization coverage of fully immunized child by year 2002 (From 95% to 98%), the team decided that following tactics have to be adopted:

- To conduct an immunization coverage evaluation survey.
- Immunization education program for the general population and medical staff.

- Program for analyzing the data on immunization.
- Program on strengthening surveillance and for tracing defaulters by calling them, sending letters, house-to-house visits and all other means to get in touch with them including announcement on the press.

The last option is currently implemented though the Expanded Program on Immunization in collaboration with Primary Health care, Health Education Section and Private sector. The tactical goal of the team is to conduct an immunization coverage evaluation survey for school children aged 6 to 18 in Bahrain between 15 June 1997 to 15 July 1997 and plan for raising the immunization coverage according to the data.

Implementation

A program to raise the immunization coverage will be implemented for the following purposes.

1) Proper training of the staff by conducting workshops twice yearly.
2) Conduct immunization coverage survey in Bahrain every 3 years.
3) Trace defaulters at school by checking their immunization cards annually.
4) Identify the areas with low coverage by conducting twice-yearly visits and to improve the coverage in such areas.
5) Conduct national immunization days annually by having two rounds over a 5 days period and 4 weeks apart every year for polio eradication for the coming 3 years.
6) Strengthen school immunization by reviewing their schedule annually.
7) Update the immunization schedule according to our report and actual data by annually issuing an immunization update.

Result

After the implementation of the plan, the following results were identified.

1) Determination of the prevalence of EPI target diseases.
2) Determination of the present immunization coverage in preschool children.
3) Conduction of the survey was approved by the Ministry of Health and the campaign was taken.
4) In 1997, a cluster sampling survey was conducted among school children in Bahrain schools. A total of 20,029 children cards were checked and analyzed; and the result shows that immunization coverage of fully immunized child is estimated to be 96%, which is less than the target of 98%.
5) The first round of polio national immunization campaign started in November 1997 and 2nd round in December 1997, with a coverage rate of 97% during the campaign.

Recommendation for Continued Improvement

I think the team should have determination, cooperation, dedication and proper time management in order to achieve the set target of improvement for our future projects.

Dr. Muna Al-Mousawi
EPI Manager
Public Health Directorate
Ministry of Health

Reduce the Retake of Intra-Oral Radiographs

Problem Statement

Although all dentists are trained to deal with intra-oral radiographs (take, develop and interpret), still we often receive radiographs that are below the standards, i.e. unsuitable for the diagnostic purpose.

Despite the efforts to present X-rays in their best quality, by retaking the radiograph, the patient is re-exposed to unnecessary radiation and, of course a waste of time and materials. If the operator has to accept the available radiographs despite the quality, it may easily lead to misdiagnosis or inability to identify the existing problem of the patient.

The aim is to reduce the retaking of intra-oral radiographs from 58% to 15% per year by Dec. 1999 (i.e. by 43%), thus, reducing the cost of materials used and manpower cost by 43% annually as well.

Root Cause Analysis

The team members had meetings to identify the causes of the problem. Listed below are all the possible factors that my lead to this problem.

1. Technical problem in the x-ray equipment.
2. The use of expired solutions for processing the x-rays or improper storage.
3. The user lack knowledge on how to operate the x-ray equipment.
4. Improper use of the x-ray processing equipment (which is done manually).

We obtained an updated report from the engineering department regarding the condition of x-ray equipment and found out that there are 23 total equipments -18 are still valid, 3 are repairable and 2 are not valid. Action was taken accordingly to repair and replace the non-valid equipments. We have checked the suppliers of the film and found out that all films and processing solutions are valid (if) stored according to manufacturer's standard.

The team focused on the last two possible causes of the problem and decided to create questionnaire and distributed it to all dentists to investigate further. The results showed that only 39.9% answered correctly and 60.1 % answered incorrectly or don't know the answer. Based on the questionnaire analysis, it was clear that the defect lies within dentists themselves.

Solution

Using Driving and Restraining forces, the following solutions were presented.

1. All intra-oral x-rays are to be carried out by a trained radiologist as in some hospitals. Dental x-ray department is established and qualified per sonnel are employed to deal with all types of intra-oral radiographs.
2. To train existing staff members (dentists) on the proper use of the x-ray equipment, and the ideal method of processing x-ray film.

Implementation

After analyzing the two given solutions to the problem, the second option was more preferable. A well comprehensive course was planned to train the existing staff members on the proper use of the x-ray equipment, and the ideal method of processing x-ray film. The course was divided into three sessions, 2 hours each for a total of 6 hours. It was conducted from 12:00 to 2:00 PM for three weeks. Each group was of ten dentists only. The course included educational and practical sessions and a brochure was given to all participants for future reference.

Result

The questionnaire, which was used in finding the causes of the problem, was used again after 3 - 4 weeks of finishing the course for each group, and the analysis shows a tremendous change of knowledge among the group from 39.9% before the implementation to 95.5% after the implementation of the solution.

The subjective qualities of x-rays were assessed according to NRPB (National Radiological Protection Board) rating of radiograph quality.

The table below shows the quality rating of 50 x-rays done before and after attending the course

Rating/Quality		Percentage after the course	Percentage before the course
1	Excellent	56%	7%
2	Diagnostically acceptable	25%	35%
3	Unacceptable	19%	58%

Annually the average cost of the equipment, film, materials, and the manpower involved during the process of taking each intra-oral x-ray is about BD47,000

The cost of wastage due to the 58% retake rate is BD27,260. So by reducing the retaking of the x-ray by 39%, we will be able to save BD10,631.4 BD annually.

Although our target was to reduce the retake to 15%, we were able to reach 19% (4% less), but it is a close figure.

Recommendation for Continued Improvement

Continuous evaluation of all factors that may lead to this problem should be monitored and assessed. Future refreshment courses may be necessary. The dental assistants should also attend the same course in the future to ensure continuous improvement, as they are also sometimes involved in the processing of the radiographs

Dr. Munem Haffadh
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Nain Health Center

Increase the Coverage Rate of Child Screening at One Year of Age by 10% by Year 1998 in M.C.H. East Riffa Health Center

Introduction

East Riffa Health Center is class "A" Health Center in Region 4 and offers curative and preventive health services for the residents of East Riffa area. It provides child-screening services, which started in Bahrain in 1986 and is also offered in all other health centers. The aim of child-screening program is early detection of abnormalities, so proper treatment will be provided before it gets severe. The MCH team consists of 5 family physicians, 2 community health nurses, 2 MCH practical nurses and 1 MCH supervisor.

Problem Statement

The coverage rate of child screening at the age of 1 year is below average, which is shown in the 1995 statistics (average is 66% and East Riffa coverage is 51.5%).
Our goal is to increase the coverage rate of child screening at the age of 1 year by 10% by end of 1998.

Root Cause Analysis

The team jointly developed a questionnaire to know the causes of the problem and distributed it to the physicians (5) community (2) and other members of the team. We conducted pilot study for 3 months from July 1997 to September 1997.
The following are some of the root causes found in the study:

1. Poor attendance on screening appointments despite efforts to follow-up on defaulters.
2. Some families prefer screening in private clinics, visiting HC only for vaccinations.
3. BDF hospital has taken on part of the load of screening.
4. Wrong statistics because recurrent CHN turnover directly affects the method of data collection.
5. Lack of coordination between MCH and record room.
6. Parents refuse the screening due to various reasons, such as work, busy schedule and other commitments.
7. Expatriates frequently change their addresses and are not permanently registered in one health center.
8. Shortage of staff, which causes children to be sent back without screening.
9. Busy clinic due to unsystematic arrangement of appointments.
10. MCH. staff are increasingly involved in other important activities like home visits.

Alternative Solution

After studying the root causes, the team selected three main solutions as follows:

1) Increase number of staff
2) Sub-special child screening clinic
3) Update MCH. activities

The team considered establishing a Sub-special child screening clinic in the future and updating MCH activities selectively, based on the manpower situation.

Implementation

Some of the steps accomplished since June 1997 were:

1. Have community nurses contact all defaulters by means of letters, phone calls and home visits, and arrange screening appointments for them, making sure that they come half an hour early.
2. Meeting the regional sister to make arrangements to keep a community nurse and 3 practical nurses permanently to overcome the load in MCH.
3. Communicating with MCH staff and head of administration to develop best coordination, and scheduling 16 fixed child-screening appointments, three for each doctor every morning.
4. Meeting with the team and with MCH coordinators about our project.
5. Preparing and reviewing questionnaire for staff.
6. Meeting with the head of health education to assign a health educator 3 days/week with all the resources to provide patients information about child screening.
7. Encourage parents and educate them on the importance of child screening.
8. Training practical nurses on data entry of statistics.
9. Training doctors and community nurses on specific examination of child screening.
10. Informing patients about the changes and contacting patients who have appointment for child screening within 1 - 2 days.

Results and Recommendations

The table below shows the increase in child screening coverage rate by 6.76% (2m), 8.95% (4m), 1.39% (6m), 12.49% (9m) in the period July - Sept. 1997, as compared to July - Sept. 1995.

Started from	Age	1997			1995			Outcome %
		Fully Screen	Total	Percentage %	Fully Screen	Total	Percentage %	
July 97	2m	171	181	94.47	150	171	87.71	6.76
	4m	141	165	85.45	114	149	76.5	8.95
	6m	115	177	64.97	103	162	63.58	1.39
Sept 97	9m	126	220	52.27	73	163	44.78	12.49

It also resulted in no more patients crowding near the doctors room or MCH section, files being ready in doctor's room before consultation and appointments being more systematic. The work is now equally distributed between the MCH. staff, and the doctor has enough time to examine the child and give proper advice.
However, since the aim of our study is to increase coverage rate in one year, we will have to wait for another six months to see the full picture. The results have encouraged the staff to continue to strive for more improvements.

The team recommends establishing a sub-special child-screening clinic and increasing the coverage rate of child screening at 6 months of age in the future for continued improvement and progress.

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To Reduce Waiting Time at Primary Health Care Level Facilitates Radiology Reports and Performance/Reporting of Special Procedures

Background of the Subject

At present, reporting of x-rays taken in all health centers in Bahrain and performance of special radiology procedures are conducted at the primary care radiology pool at Naim Health Centre (NHC). X-rays are collected from all health centers and sent to NHC for reporting. Typed reports are collected and organized for distribution to various health centers. This process takes a minimum of one week to an average of 10 days.

Radiology procedures requiring preparation, lengthy supervision and direct involvement of radiologist for patients from all health centers in Bahrain are performed at NHC The waiting list for these examinations ranges from an average 6 weeks to 20 weeks. This situation is a result of many factors, including population growth, expansion of Primary Health Care Services, increasing number of HC patients, who express their dissatisfaction with the following:

- Lengthy wait for radiology reports results in suffering (pain, discomfort, absence from work, etc.).
- Delay in management, either at primary care level or referral to secondary care facility.
- Complaints from Health center doctors: a delay in receiving the radiology reports prevents timely intervention and tarnishes their name and medical reputation.
- The authorities at the Ministry of Health are unhappy since patients' dissatisfaction and doctors' complaints reflect badly on the health services.

Objectives of Planning Project

To reduce waiting time at Primary Health Care level/facilities for:

1) Radiology Reports
2) Performance of and reporting of special procedures (IVP's, barium studies)
   i. For Muharraq 3-4days; for others 8 days by 1989, then for each added facility subtract two days until we reach the target of 1-2 days for all by 2004.
   ii. For Muharraq, down to one week maximum; for others down to 2-3 weeks (IVPs) and 3 months (bariums); and then for each added facility, subtract 2-4 weeks to reach a target of 3-7 days for all procedures by 2004 in order to improve patients' satisfaction.

The **options**, including strengths and constraints to improve patients' satisfaction in reference to the interconnected areas presented above, can be grouped as follows:

1) Decrease load from source through various legislative financial approaches: Is not a feasible option since it requires protocols, monitoring, auditing, continuous training of doctors, and charging patients for primary health care needs (a political decision.)
2) Decrease load on reporting of x-rays by "reporting on demand": If the Radiologist's opinion is left to a primary care physician with insufficient training to evaluate, it will lead to inferior service.

3) Use of NHC pool after-work hours on overtime basis: will increase the demand on already overstretched services and is contrary to MOH policy to reduce use of overtime.
4) Introduce better technology for a more efficient typing of radiology reports (computerized reporting), transfer of reports to the primary health source (HC) via telecommunications. There is already work in progress and will require appropriate training, expertise and financial investment.
5) Increase the number of radiology staff (doctors, technologists, secretaries): This option has many constraints, not least the lack of adequate space to accommodate extra staff or for waiting patients.
6) Increase the number of machines within NHC radiology pool: Similar constraints as in option 5.
7) Improve roads and access to NHC: An impossible option with constraints as in items 5 and 6
8) Create facilities similar to NHC radiology pool in other areas of Bahrain, taking into consideration the source of load, distance from NHC, population distribution and density. This option has several advantages:
    i) Re-distribution of total load will result in shorter waiting period for radiology procedures, timely preparation of reports, easy and rapid access to reports.
    ii) Less need for courier/porter system.
    iii) Available, convenient and accessible service.
    iv) Timely intervention and early referral to secondary care facility.
    v) Accessibility of service in the afternoons and nights to health center doctors, therefore less need to refer patients to SMC A&E Department.
    vi) Decentralization.
    vii) Wider and better opportunities for training FPRP and radiology residents.
    viii) Employment opportunities for more health workers, radiologists, technologists, x-ray aides, clerical and administrative personnel.

Strengths of the above proposals stem from the following:

- Primary Health Care authorities welcome the idea
- Acceptance of workers (doctors, nurses, etc.) at the HC level
- Meets the demands of patients for prompt, efficient health care and proximity/accessibility at primary care level
- Improves the image of primary health care service with its concept of "comprehensive" coverage into a practical framework.

Time Scale

Bahrain is divided into four geographic areas. It is recommended that each geographic area should have at least one "pool" similar to the radiology pool at NHC. (1) **Muharraq region**, (2) **Manama region** (present NHC. pool can cover this area),(3) **Eastern Region** (with Isa Town as its center) and (4) **Western Region** with Malkiya as its center.

Muharraq is considered an ideal starting point to be followed by the Eastern Region, and finally, the Western Region. If put into effect, all radiology pools should be in place by 2002/2003. Radiology pools must be located in a category **"A"** Health center.

Monitoring and Review

Recommend that H.E. The Minister of Health set up a task force (reporting to the Assistant Undersecretary for Primary Health Care) with the following membership:

Chief Radiologist - Chairman
Chief Radiology Technologist
Medical Equipment Center Engineer
Building and Maintenance Engineer
Administrator, Primary Health Care - Secretary
Financial Advisor

The Task Force should monitor the progress of the project at all stages of development until completion. The Task Force shall meet once a month initially or as many times as required in any one week depending on the progress of work, and not less than once every two months. The Chairman shall set its agenda and the Minutes of the meetings shall be forwarded to H.E. The Minister and the Assistant Undersecretary for Primary Health Care.

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Lab Result Filing

Introduction

Primary Health Care (PHC) services are provided by the Ministry of Health (MOH) through a network of twenty-one Health Centers (HC) and clinics scattered all over the Kingdom of Bahrain, plus several specialized clinics for chronic diseases within these health centers. The strategic plan of PHC services is to continue improving the quality and quantity of services. Quality Care in health centers is achieved when accessible services are provided to the patients in an efficient, cost effective, and acceptable manner.

National Bank of Bahrain Health Center (NBBHC) is one of 21 health centers distributed among different areas in Bahrain. It is a type (A) health center in Region 1, where curative and preventive services are provided by qualified family physicians and other staff in the Pharmacy, Laboratory, Radiology, Physiotherapy, Dental section, Maternity and Child Health Care and Medical Records service. Among the duties of the medical records staff is to fix the lab results in the patient's file before the next appointment with the physician.

Problem Statement

NBBHC serves between 300-400 patients on a daily basis during working days (Saturday to Wednesday). Around 30% of these patients attend the HC to follow up on lab tests results. It was found that nearly 8% of these patients were sent back by their doctors to get their results, either from the medical record section or from the lab. Unavailability of lab results is a chronic problem in all HC's that causes delay in treatment and decreases the quality of care, which leads to patients' dissatisfaction.

Smart Goal: The aim of intervention is to minimize by 50% the number of patients whose results are not available in their files.

Root Cause Analysis

A team was formed with people from sections concerned with the problem who are eligible to find the required solutions. Several meetings were held where the following were defined:

- The lab results usually pass through several stages, which involve the Physician, Patients, Laboratory Section and Medical Record Section.
- Lab test is done in the local HC, Naim HC, Public Health or SMC. Any negligence, faults or delay caused by the concerned person or unavailability of resources could lead to the problem of non-existence of lab results in the file.

The team also identified all possible causes of non-existence of lab results in the patient's file as follows:

- Patients lack awareness of the procedure, incorrect addresses/CPR number and some are not registered in the health center. Patients collect their results ahead of the scheduled time.
- Physician's handwriting is not readable and sometimes does not provide instructions or not fixing data for follow-up.

- Lack of manpower and facilities like computers.
- Results from SMC, Naim HC or PH are received late or sometimes missing due to shortage of staff, testing material or specimen is insufficient for analysis.
- Staff lack sense of responsibility and are inefficient in organizing files.
  We studied the actual size of the problem for 4 weeks starting from September 1, 2001.

Solutions and Implementation

The team used brainstorming technique and subsequently asked all physicians to send all patients with un-filed results to the medical record sections, first. One clerk who is a member of the team dealt with these patients. Detailed information was taken; and after data analysis, the following was found:

Out of 2,126 lab results, which were taken to the medical record section during the project period, 554 (26%) were not filed.

Size of the problem

MONTH	No. of Results taken to the clerk	No. of Results not filed	% Results not filed
September 2001	2126	554	26%

Cause analysis of the problem showed

MONTH	Delay filing & early pt. attendance		Wrong address and CPR		No files in HC		Unclear Drs. Handwriting		The files not in the correct places	
September 2001	227	40%	150	27%	53	9.6%	82	14.8%	42	7.6%

Based on the root cause analysis we have identified the common causes and after further group discussion, we agreed on the following alternative solution, which could improve the situation:

- To record all the lab results, which are sent daily to the clerk from lab section and put a date stamp on each tests results to identify the date received.
- The clerk should write on each test result, the reason why it is not placed in the patient's file, before returning any lab result to the lab.
- For the tests that are not very urgent, patients are told to collect their results after three days instead of the same day.
- Letters were sent to the companies asking them to register their workers in the HC.
- Patients were given a gap of ten days for follow-up appointment, to finish necessary procedure in obtaining lab result.
- Physicians are asked to write the basic data of the patients correctly and in clear handwriting.
- The clerk or their subordinates should file the lab results within two days.
- Patients are asked to update their records, in case of changes in address and telephone numbers, and bring their CPR card in each visit to HC

Result

We applied the intervention steps for 4 weeks, during which the team members met together and discussed the importance of this project in solving the critical and chronic problem we are facing in our HC, which affects all the parties who are our main customers; so to refreeze the changes we need to improve the quality of ser-

vice to ensure customers satisfaction. After achieving significant improvements, all our team members received letter of thanks and appreciation. This will encourage them to work hard.

Size of the problem

Month	No. of Results taken to the clerk	No. of Results not filed	% Results not filed
September 2001	2126	554	26%
October 2001	2432	444	18%

Cause analysis of the problem showed

Month	Delay filing & early pt. attendance		Wrong address and CPR		No files in HC		Unclear Drs. Handwriting		The files not in the correct places	
September 554	227	40%	150	27%	53	9.6%	82	14.8%	42	7.6%
October 444	170	38.2%	115	25.9%	65	14.6%	62	13.9%	32	7.2%

The tables above show significant improvement after the implementation of changes. The number of results that are not filed decreased from 26% during September 2001 (before the introduction of the change) to 18% (after the introduction of the change) during October 2001.

Recommended Solutions

- To establish a standard in putting results in the files according to the information and statistics given with respect to the problem.
- Continuous quality improvement system.
- To develop appointment system using computer program in order to achieve precise information.
- Staff motivation.

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Improve the Quality of Glocose Solution Utilized for GTT Diagnostic Laboratory Test

Introduction

Primary Health Care is offered through a network of twenty-one health centers scattered all over the Kingdom of Bahrain. Primary Health Care units offer curative and preventive services operated by highly qualified family physicians, assisted by allied health staff and act as entry points for citizens to high quality health care services. According to the strategic plan, Primary Health Care Services is to continue improving the services, both in quality and quantity.

Quality in Healthcare is achieved when health services are efficient, cost-effective, accessible and controllable, and when the needs and expectations of the customer (patients) are met.

Problem Statement

One of the most critical diagnostic tests diabetic patients have to undergo is Glucose Tolerance Test (GTT), which is carried out at most peripheral health center laboratories. Patients must fast for 12 hours overnight and come to the Laboratory early in the morning, when initially urine samples are collected and then the patient is given a homemade, locally prepared glucose solution to drink. The highly concentrated glucose solution (30% glucose/water), which is hot since it is difficult to dissolve glucose in cold water, lacks color and flavor and causes nausea and vomiting. The homemade preparations are not cost-effective and about 60% - 70% of patients frequently complain about the drink as they find it unpalatable and unsatisfactory.

Smart goal

Improve patient satisfaction from the present 30% to 80% by November 2000 without increase in budget, by providing a ready-made glucose solution with flavor and additives that could be served cold.

Root Cause Analysis

Taking into consideration that individual team members will complement each other for a synergist effect, a team was formed according to Belbin's Team roles Recognizing that a key part of strategic management and environmental alignment is understanding what customers truly want and how best to provide products and services that satisfy them (Griffin, 1999), the team undertook the following steps:

1) A questionnaire was distributed to 15 patients requiring GTT tests to evaluate the quality of the solution after they drink it.
2) The quality problem identified in the study was that of patients' dissatisfaction with the oral sugar solution that is prepared manually at the laboratories.
3) The frequency of complaints by category was calculated as timelines of service, staff attitude, taste, color and temperature.

Alternative solutions

Three possible alternatives were considered by the team to improve the quality of oral glucose solution, which subsequently will improve the accuracy of GTT test results:

1. Order ready-made glucose solution from overseas.

2. Manufacture the glucose solution at one of the local companies.
3. Improve the homemade glucose solution by adding artificial flavors and color.

A cost estimate study was done to compare the three alternatives; and the team selected alternative #2 as the price was cheapest, while the quality of the product is much better compared to the homemade solution (alternative #3). Although alternative #1 was best in quality, its high cost was against the smart goal, while alternative #2 is ready-made, cost-effective and saves manpower time.

Implementation

A pilot test was carried out before implementing the selected glucose solution. The selected company, Bahrain Danish Dairy Co., was asked to produce 20 samples (prepackaged cups) of 30% pure glucose solution. Before administering the solution to patients, samples were sent for chemical analysis at the Public Health Laboratory. New samples were ordered after the samples were rejected when they were found to be concentrations of "maltose" instead of "glucose". After the new tests results were approved as acceptable and in accordance with the expected standards, additional tasting and evaluation was carried out by staff and team members.

15 patients at Naim Health Center Laboratory were given the improved ready-made glucose solution to drink and asked to answer the customer satisfaction survey. As the patients' satisfaction increased and they accepted the improved solution, Bahrain Danish Dairy was requested to produce larger quantities of the solution.

Refreezing

1) Plastic cups were designed with printed name and required information.
2) Laboratories were requested to estimate and submit their annual requirements to the Directorate of Materials Management (DMM).
3) The new glucose solution arrived at the Central Stores and has been allocated stock numbers.
4) Laboratories have been informed of the availability of the new solution.
5) DMM has been asked to reduce the purchase of the old items (glucose powder/cups which were used to prepare the homemade solution).

Results

Overall the results in the Health Center laboratories show an increase in patients' satisfaction with the new glucose solution. 73% of patients have expressed their satisfaction and an incredible 100% satisfaction with the temperature of the new solution. 93% were satisfied with the color and odor of the new solution. Improvement noted in time-line of services along with an improvement in staff attitude and behavior towards patients is attributed to communicating the results of the initial survey to technicians.

Recommendations for Continued Improvement

1) The Public Health Laboratory should perform a monthly quality control check on the ready-made solutions.
2) Employees involved in the improvement should be rewarded.
3) In addition to engaging the Bahrain Danish Dairy Company, the market and producers should be examined.

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Improvement of Information Systems

Ministry of Health Intranet Project

Introduction

The Ministry of Health (MOH) employs about 7000 staff and is responsible for the provision of health care services and the management of supporting programs and organizations. MOH operates one General Hospital, Salmaniya Medical Complex (SMC), five maternity hospitals, two specialist hospitals (Psychiatric and Geriatric) and twenty-one geographically dispersed health centers and clinics.

The Health Information Directorate (HID), responsible for all information systems and information technology deployment in the Ministry of Health in Bahrain, consists of a comprehensive suite of health management applications servicing the major hospital in the country, as well as systems to handle materials management, personnel and finance within the organization.

HID is about to begin projects to expand health management applications in all health care units (primary and secondary care) to implement additional modules to replace a number of existing systems.

Problem Definition

Lack of common information repositories cause different types of problems that hinder communication between directorates and prevent increased productivity of each directorate which results in wasted time/efforts for decision makers in accessing the right information at the right time, as listed below:

- There is no well-defined structure for making information available to other directorates except by email or by a letter. Imagine how much communication time, efforts, papers and money are wasted if a message needs to be transferred to all these directorates to be posted on their notice boards.
- The current email application has its limitation, since it is just an off-the-shelf office organizer package, and the user cannot use it to run or access applications.
- A lot of time and effort is wasted when asking for information from other directorates.
- Using different user interfaces to access applications requires a lot of efforts and money to establish these interfaces.
- Using different user interfaces will require different types of training for users dependent on the application user interface.
- The volume of paper (letters, faxes, notice board messages, etc.) used to share information between the directorates is huge.

Problem Root Cause

A major obstacle hindering the Ministry of Health from entering the new era of technology was a lack of electronic infrastructure media and shared information repositories to enhance communication. Even though there are network and email services there was no shared information repository to enable directorates to share data with others. Other directorates/users cannot access shared information because they have different information repositories. Another root cause of the problem is that there is no unified standard user interface to access software applications, which requires a lot of training, especially if they have been developed on different platforms.

Alternative Solutions

1. **Provide the services through WWW Internet.** This option is to provide the entire service through developing a site on the WWW Internet and give an internet access to all the users.

Advantage

- Having a wide access to a lot of information on the Internet.
- Very good in terms of exchanging relevant data with others outside the Ministry.

Disadvantage

- Some of the information is quite private to businesses.
- It will be very hard to monitor the security, since outsiders will have access to the Local Area Network which might cause severe damage to the Ministry's data.
- There are only 36 computers out of 1250 computers in MOH that are linked to the Internet. Linking all computers to Internet is very costly.

Cost: Internet access will be very expensive.

2. **Building up an Intranet:** Another option is to build a site on the local server and utilize the local area network (Intranet), which can be defined as a private computer network based on communication standards of the Internet. It is a smaller version of the Internet that only MOH staff can use. Companies can create a manageable, secure version of the worldwide web within their walls. In other words, Intranet is a private network.

Advantage

- Utilizing the existing local area network and server.
- Very secure since it is running on local area network.
- Using Microsoft Explorer, which is a common user interface to access the consent of the Intranet.
- Most computers in MOH are linked via a local area network.

Disadvantage

- Putting more pressure on the local area network in terms of data transfer, which in the Ministry's case is quite negligible since fiber optics are used for cabling and connectivity.
- Training is required for users who do not know how to use computers or web browsers very well

Cost: since the local area network is already built, with most of the users having computers, availability of a local server can be utilized for this project at no additional cost except for labor, i.e., Ministry staff needed to develop the site on the Intranet.

Selected Solution

The selected option was to build the MOH Intranet as an effective tool to combat the wasted time, effort and materials within an organization at the same time generating new opportunities for collaboration and productivity. Tangible benefits of the Intranet are:

- Improved decision making
- Empowered users
- Builds a culture of sharing and collaboration
- Facilitates organizational learning
- Breaks down bureaucracy
- Improved quality of life at work
- Improved productivity

Implementation

The project started at the beginning of May 2000 and the scope was to build the MOH Intranet Infrastructure and pilot two directorates' information (Health Information Directorate and Accident and Emergency Directorate) on Intranet.

A team of five people was formed to conduct the project with the goals and objectives to improve communication by facilitating easy access to information, improve quality and time relevance of information, reduce duplication, improve communication speed, reduce paperwork, provide search facilities for internal users, enable departments to use the system for administrational purposes (timekeeping, etc.) and provide more information to decision makers.

Another goal was to decrease costs by reducing MOH stationary costs, printing machinery and related expenses, minimizing storage space and respective administration required by departments and the Ministry as a whole and reduce reliance on messengers and intermediaries.

This would be enhanced further by also strategically positioning MOH nearer towards future privatization and E-government by minimizing functions reliant on allied/shared services (messengers and interdependence of administrative information), facilitating department accessibility to own accounting and administrative data and gradually furnish necessary aid for different functions to act as profit centers and bill one another automatically on their services.

The team also set up the policies and procedures to control the development of the Intranet project.

The first Intranet server was installed early 2000 using the existing NetWare platform and Netscape Fast Track (Novonyx) server that comes bundled with NeWare 5.0. Novonyx is reliable and easy to manage, but it is very basic and does not support ASP. As the Intranet project became well established and because the Web pages are developed using the latest Internet Development Languages (Java Script, ASP), there was a need for a web server that supports ASP and was considered very good from the administration and security point of view. The solution was to use Windows NT 4.0 with IIS, which proved to be fine from both users and developers perspective. In addition, technical modification was done to the existing set-up, making it compatible with the technology used.

One of the most difficult things in the project was the coordination with users and collecting directorates' written materials to be published on the Intranet. To reduce the impact of the users on the development and time interval of the project, a content committee was formed from users of different directorates. This committee was basically responsible for collecting all materials from directorates, and have the final appropriate decision of the content to be published on the Intranet site.

The Intranet site was entirely designed and developed in-house by the project team members. The design and development concentrated on producing the site just for two directorates with the ability to rollout the project to other MOH directorates with minimum changes in the basic design. In other words, the site is a scalable site.

By June 15, 2001 the Intranet site was ready and it was installed on the production server. The sites was monitored for performance for a complete week. Trouble shooting on the Intranet site was carried out by team members until it was completely ready for official launching.

Since Intranet is a very new terminology for new users, it was very important to raise their awareness about the importance of this project to ensure that they will be

more committed to help us in completing it by developing a newsletter that was published and circulated to users to keep them informed and updated about the project. Training was conducted for demonstrating the Intranet site to HID and Accident and Emergency Staff by forming four groups according to their section and using a training checklist form, which was designed to cover all details appearing on the site within each group's training session. For rolling out, training was conducted for MOH staff and will be handled in coordination with the Continuing Education Section of the Directorate of Training.

The project was well documented using the Navigator System series methodology by Ernst and Young, both in box files and electronically and by creating user and technical manuals.

Completion of the Project

The project of developing the Intranet site for two major Directorates, HID and Accident and Emergency, was successfully completed on June 25, 2002. The project team fully organized the official launching of the site.

Future Rollout of the Project

The rollout plan was created based on the following criteria:

- Cross sectional departments: these represent main functions in MOH where it affects more than one area (e.g., nursing, radiology, laboratory, pharmacy, medical records).
- High interest high success: this refers to the departments that have interest and high desire to develop Intranet web site (this will be judged by the level of cooperation and responsiveness received).
- High profile: (measured by the number of daily transactions).
- High user need: Departments which have issues and problems, and believe that technology will definitely help resolve some of them.
- Health Care focus.
- Based on the above criteria, six other directorates were selected for rollout, and it is expected that these sites will be active by the end of March 2002.

Evaluation

The project team produced an evaluation plan of the site. The objective of this plan is to evaluate the MOH Intranet website to ensure the benefit for the users in terms of information provided, education, knowledge and to ensure the use of the three ways of communication in order to fulfill the customer needs and improve productivity and quality.

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Reorganization of PIMS

Problem Statement

The (PIMS) Unit within the Health Information Directorate is mainly responsible for the development, implementation and maintenance of Application programs in all Directorates and departments within the Ministry of Health. The unit has a long backlog of systems that need to be delivered; but staff in the unit feel that they are busy supporting existing Computer Application Systems, and they cannot handle new assignments and projects due to increased staff turnover and other administrative issues.

Recently the PIMS unit has faced a problem with increasing staff turnover. Staff assignment for support and development is not clear and not documented. Computer Application Systems fall under two major categories: Health and Administrative systems. Requests are categorized into four main categories: Changes to existing systems, reports, parameter changes, and new systems. Requests are not recorded and information is scattered between staff. Users are complaining about response time to attend to their requests. PIMS is unable to meet user demands on enhancement, correction and delivery of new systems and lacks a clear picture on the overall current and future workload.

Root Cause Analysis

Different members of the team had several sessions with major end-user departments and identified three main causes for the problems. It was found that member and team responsibilities are not well established at the PIMS unit, user department request are not being formally received and recorded, and that there was no operational plan for the execution of pending projects.

Solution and Implementation

A SWOT analysis and a Driving/Restraining forces exercise was performed to identify the best solution to resolving the problems, and resulted in reorganizing PIMS into two main groups (Health Systems and Admin and Finance systems), and reassigning responsibilities and roles of the PIMS staff. Due to the difficulty in piloting the solution, actual implementation of this solution was exercised without any piloting. Implementation had to go through several steps that were internal and external to HID, using the transformation of freezing and unfreezing.

- **Unfreezing**

  Two senior analysts were selected to become coordinators of the Health Systems and Admin. and Finance systems, and roles and responsibilities were discussed and assigned. A document listing all systems and associated team members' responsibilities was produced which detailed the reorganization of PIMS into 3 teams responsible for Admin and Finance systems and 4 teams responsible for the Health System, each team consisting of two members. The teams later conducted a presentation at which the proposal was explained to members of PIMS and other managers at HID, resulting in the proposal being finalized. Affected users were informed of the new changes and procedures. New staff would be given internal training to handle new responsibilities, and recording of user requests were started as per the new procedures. The Project List was revised of the target dates and required resources allocated.

- **Freezing**

  The size and complexity of the situation made it impossible to implement some of the major steps detailed above. Some of the teams members would complete the handover plans, while other members could focus on systems they support. A final version needs to be produced and distributed to users to serve as a guideline for requesting changes, and systems and job descriptions were revised and submitted for approval.

Results

All requests for change were recorded in a spreadsheet and filed documents were made accessible to all staff. Another improvement process was insuring that each system is supported by a minimum of two staff members. The final key result was producing and maintaining an up-to-date project list with target dates. The table shows the figures before and after the improvement process:

Table I - Results Improvement Table (Improvement figures as of 1st December 1997)

RESULT AREA	Figure before Improvement	Figure after Improvement
Recording of Requests		
Number of requests recorded	5	75
Staff Support to Systems		
Number of systems supported by 1 staff member	4	0
Number of systems supported by a minimum of 2 staff members	10	20
Project List		
Number of listed projects with planned start and dates	2	8

Recommendations

Communication skills should be utilized effectively with user departments to make the project more successful. Change would be more effective if it related more to the organization goals and vision, not just resolving issues associated with systems. It is essential to include team members from selected user departments involved to improve the level of service offered. Training team members in basic team skills training would make team members more effective in joint activities.

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Ministry of Heath

Ineffective Communication Services

Project Initiation

The Ministry of Health (MOH) for the State of Bahrain employs 6,632 employees (1999-Health Statistics) and is responsible for the provision of Health care services and the management of supporting programs and organizations. In addition to the operation of one General Hospital (Salmaniya Medical Complex), various hospitals and Health Care Service units are geographically dispersed. Beside the Health directorates, the Ministry also consists of different offices. All these units need to communicate internally with each other and with other Ministries, Suppliers, overseas, etc. The communication process could happen using different means of communication through telephone lines, memos, circulars, mailing systems, messages and through meetings' minutes/agenda, etc.

Problem Statement

Various problems were encountered due to the vast expansion of the Ministry services and increasing demands on quick communication. There are many complaints regarding the communication services such as letters are received late and the information is already obsolete. More than one person is involved just to send one letter that is delivered hand-to-hand.

Letters are often lost/misplaced due to either wrong addresses or names. Some expatriates write the address in their native languages that the clerks find very difficult to read or understand. There are only 99 outgoing telephone lines (dial 9 facility serving 4,500 SMC staff).

A team was selected (roles identified using Belbin criteria) and a simple questionnaire was developed to measure customer's satisfaction and was distributed among 200 users. The outcome showed that customers were not satisfied with the services provided. Prior approvals from the superior are required in order to send mail through a driver for hand delivery. All procedures at the post office are done manually, and chances of human errors are very high. Hence, the team's main objective was to increase customer satisfaction from 30% to 70% and improve response time at least 20% by January 2001.

Root Cause

The management and staff are hesitant to accept changes in the system because of their limited skills and they feel that their careers would be threatened if any changes happen.

Procedures in the main office are old and work processes were done manually. Lack of staff training, lack of management support, lack of guidelines/instruction, unsuitable location of office and lack of written standard resulted in 70% dissatisfaction among respondents to the questionnaire. It was also found that top management is unaware of the problems and adequate improvement or changes on the services were not provided.

Solutions and Plan for Implementation

Using brainstorming techniques in several meetings, the team decided on several solutions with the objective of increasing customer satisfaction from 30% to 70% and response time by at least 20% by January 2001. Three alternative choices were proposed:

- Continue with existing services.
- Re-engineer the mail service, a resource-intensive project.

- Introduce advanced technology using electronic mail throughout the Ministry with a capability to send external mail.

Using driving and restraining forces, the team decided to adopt the third option and decided that their target customers would be top management starting from H.E. the Minister down to the senior staff only.

The team selected an electronic mail software package (Group Wise version 5.5), featuring sending messages and appointment scheduling, online address book, document management, integrated telephone conversation and automated distribution of work, to be installed through the Ministry via the existing network.

Kurt Lewin's model was used to facilitate the implementation (unfreeze, change, and refreeze). Several presentations and meetings with the concerned persons were conducted to discuss, promote and list the benefits of the project. Beginning in April 2000, the implementation was divided into five different sub-phases according to location and network connectivity and was completed by October 2000.

Results

A questionnaire was distributed among the 200 users via the e-mail to evaluate the effectiveness of the usage and software and the results are as follows:

S/NO	Indicator	Before Implementation	After mplementation
1	Customer Satisfaction	30%	95%
2	Received immediate (within 10 - 15 Min.) Response time	35%	85%
3	Cost	• Cost of sending 1 letter = 300 Fils • Total cost spent on SMC internal mail (19,568) for six months (Jan-June = BD 5,879	• Cost of the software= BD1,500 (one time cost) and BD45 per license • Cost for 200 licenses = BD 9000

No. of users connected to Group Wise: 200 by 21/10/2000
No. of users opened and sent back responses via email: 109
No. of users opened and sent back responses (hard copy): 90
Two issues were encountered during the implementation phase:

1. Limitation of licenses (only 200 available) .
2. Some users needed more training - Tutorial sessions had to be conducted by Directorate of Training.

Conclusion

The team worked together effectively using Continuous Quality Improvement cycle and (Lewin model) to accomplish their goals and the implementation of new technology improved the quality of communication services in the Ministry of Health.

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Year 2000 Compliance Project

Problem Statement

The Year 2000 problem (abbreviated Y2K) is a universal problem that is related to both hardware and software, and stems from the fact that computers and their related software were using two digits year (YY) for the date. Since the last two digits in Year 2000 are 00, most of the current computer hardware and software will have problems in interpreting these into meaningful mathematical calculation. Since the next millennium is a leap year all systems must be tested to verify that the systems under investigation are compatible with this fact. A solution to this problem lies in amending such systems to use four-digit year (YYYY) rather than the current two (YY). To achieve this, existing software and databases have to be investigated for the problem and modified. The current hardware also has to be configured/ upgraded to overcome this problem in the Ministry.

The fact that this problem is time bound and all fixes must be in place prior to 31st December 1999 made a quick and effective solution a MUST. A team from the Health Information Directorate (HID) staff was selected to investigate the impact of Y2K problem on all Information Technology (IT) hardware and software.
Another team of which I am a member, "MOH Y2K Coordination Committee" is ensuring MOH compliance in all potential areas by the year 2000. Due to the scale of the problem, the team had to be selected from various IT potential areas. They would also be involved in the implementation phase.

As per Belbin's theory, nine team members were selected, taking into account their knowledge and competency in their respective areas of expertise. The team met every Tuesday and the Project Manager reported to the Steering Committee, which is comprised of members of the IT Management and meets every month to ensure that there are no obstacles or delays to hinder the MOH Y2K IT Project.

Objectives

Members of the team and the Steering Committee highlighted the main objectives of the Project as:

- Spread awareness between all users about the Y2K problem by September
- Evaluate and fix the Y2K problem on all MOH support applications by 30 June 1999.
- Evaluate and fix the Y2K problem on all MOH Health applications by 31 August 1999.
- Evaluate and fix the Y2K problem on all MOH IT related hardware and soft ware by August 1999.

A Project Charter was produced following an internationally approved Project Management Methodology, i.e. the "Navigator System". Schedules for the various areas under this project were produced. These schedules could be amended along the way and would serve as an excellent tool for setting up project deliverables by a target date.

Implementation

To analyze the Y2K IT problem at MOH, the following management strategy was implemented in phases:

1) **"Awareness"**: Spread the Y2K Message.
2) **"Inventory"**: List the entire software applications and hardware computer

equipment used by MOH regardless of any other factor.

3) **"Assessment and Planning"**: assessment of the scale of the problem and planning for the next three phases.
4) **"Fixing"**: Implementation/renovation on recognized problem areas.
5) **"Testing"**: Validation of the fix.
6) **"Installation"** phase: on-line implementation. This is for major systems, e.g. the main Health Information System.

To date, we have managed to reach phase four (in some cases, the five phases are partially or fully implemented). The following is a summary of what has been achieved:

Awareness:

Meetings were held with executive management and Directorate levels, to educate and formulate a plan to address the Y2K problem, particularly the Directorates of Medical Equipment and Engineering and Maintenance who would be affected were informed of the seriousness and impact of the problem. Information messages were sent to all customers on this issue, highlighting the implication on their work and effect on running projects. Presentations were conducted for different levels with emphasis on the seriousness and the immediate need to rectify the problem.

Inventory:

Three teams were created, each responsible for a different area of IT hardware/software:

- Health application (Health Information System Applications), and included Pathology, Admissions, Transfer and Discharge (ATD), Outpatient (OPD), Finance, Personnel applications, etc.
- Support application: Bahrain Nursing Registration System (BNRS), Maternal and Child Healthcare (MCH) System, Limited Private Practice (LPP) System, Catering, On-line Inventory Management System (OLIMS), etc.
- Desktop Hardware and Software Systems and Applications: servers, PC, Network equipment, Communications Equipment, Operating Systems, MS Office, Foxpro, etc.

Planning and Assessment

This stage was very essential in verifying whether the System/application is Y2K compliant. Surveys and comprehensive testing was used to evaluate each item in the inventory list. A lot of information was collected from manufacturers and suppliers regarding the compliance of their products, because this was a very demanding and time-consuming stage, and work had to be well documented. Some of the results found were as follows:

- The Health Application (HIS) system: preliminary finds revealed that the core of the HIS system was Y2K compliant. While primary results were promising with ATD, Pathology, Blood Bank, Financial applications, they would require some modification to become compliant. One major problem was that the main Personnel application "Time Attendance System" (TAS) was not compliant. This required full-time commitment (resources and time) to solve this very serious problem that would have a major impact on one of the main functions; and it was decided that a separate project would have to address this issue to ensure that the system is Y2K compliant prior to the new millennium.
- Support Application: work was accomplished in this area. Major applications within this phase (BNRS, LPP, Catering, etc) were tested and the assessment

of the scale of the work was finalized. Again, a separate project has to address these problems for Y2K compliance.

- Desktop Hardware Equipment and Software: Some ground was made on this front, manufacturers and suppliers were approached to confirm compliance, and testing was conducted to confirm compliance,

Problem Areas and Solutions

Among the problems which the team and Steering Committee encountered and took appropriate steps to resolve were:

- Full-time commitment of the Y2K team members.
- Availability of Human resources to implement the fixes.
- Y2K budget to finance the project.
- Customers' understanding of the magnitude of the problem.
- Health Test System availability and licensing.
- MOH IT suppliers and manufacturers commitment.

We obtained the support of the Central Statistics Organization, which is crucial in backing up our proposals. Though extensive measures were taken to create awareness among customers, it was difficult to quantify the scale of the problem. However, with presentations and meetings to clarify the issues, it is believed that we have achieved the full backing of MOH Management, and it is reflected in solving the problems listed above. Continuous work is going on to educate more staff, as their support is essential in covering all areas. We have obtained funding from the Ministry of Finance for the purchase of essential Y2K testing equipment and software for redeveloping support applications. Analysis state of the complete health application software is completed. Fixes will now be implemented, completion expected in December 1998. Statistical applications have been analyzed for compliance and fixes will be implemented, completion expected in December 1998. We will continue to stress ACTION on all fronts within the Ministry to achieve full compliance in all disciplines, not only IT.

Recommendations

There are some issues that need improvement for better results in future projects. For instance, a project such as this should be given top priority by everyone concerned, especially when it is linked to a time frame. Information storage systems need to be reviewed continuously to assure total quality management and proper organization of data.

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Achieving Adequate Health Records System

Introduction

The health record contains recorded facts and sufficient information to identify the patient, to justify diagnosis and treatment and document the results accordingly. The medical record is also used to communicate between teaching and training, service statistics, research, appraisal of medical practice and legal requirements. Physicians and health care professionals are responsible for accurate documentation on the care they provide. It is well known that measuring the adequacy of health record is a direct way of measuring the quality of patient care.

Problem Statement

It was defined that the pediatric health records for the inpatient service at SMC are adequate by 38.6% for a studied criteria (i.e. History, Physical Examination, Progress Note, Discharge Summary, Medication Sheet, Computer Sheet, Clinical Impression, Order Sheet). The pediatric age group that is below 15 years constitutes 30.8% of total population in Bahrain, and they also constitute 15% of the total in-patient services at Salmaniya Medical Complex (SMC).

The junior residents fill the patient's health record, followed by assessment and plan by a senior resident with overall supervision of a consultant. So far not much attention is given to ensure the adequacy of patient health records for each patient admitted, though there is a policy that insures compiled and well-stored health record. The improvement in the health record has a strong impact on the patient health care and might limit unnecessary expenditure. The team aimed to implement an adequate, accurate, timely and complete medical record for each patient, which raises the standard of health record to 85% in regard to completeness and accuracy within 5 months, and to create a mechanism that insures its continuity.

Root Cause Analysis

The process of planning was started, using the mission statement as a guide for planning strategies. The team used brainstorming technique, using Kickoff project questionnaire as a reference for each meeting, to make a schedule for work breakdown structure and defined the control of system. Using stakeholder information technique, the team identified the root cause analysis as follows:

1. Unawareness of the problem.
2. Low Supervisory skills.
3. Tendency to Centralize decision-making.
4. Current System and Policies.
5. Training.

Alternative Solution and Plan for Implementation

Considering the driving and restraining forces in addition to the short time of the project, the team proposed the following alternative solutions:

1. Increase awareness of the problem.
2. Include this in the resident evaluation by establishing a new evaluation form for measuring the adequacy of the health record keeping.
3. Improve resident's ability by conducting workshops on health record keeping.
4. Improve supervisory skills.

Solutions 1 - 3 were selected because they are within my jurisdiction as training coordinator, while solution 4 was considered the most important factor for improvement.

Implementation

Kurt Lewin's model was used to implement change (unfreeze, change and refreeze).

1. Communicating change: the people concerned met and helped put together a plan for change (unfreeze).
2. Increasing driving and decreasing restraining forces (Change) by improving self-supervisory skills, obtaining support from senior consultants and establishing new evaluation form for record keeping.
3. Continuous evaluation during implementation process by seeking feedback.
4. Anticipating adversity and resistance to change (Refreeze).

Result

The Pilot study (1) was done after two months of implementation for 20 files and Pilot study (2) for 40 files. The table below shows the percentage of adequacy of patient records for the items studied at pediatric department / SMC.

ITEMS	BEFORE IMPLEMENTATION	PILOT 1	PILOT 2
History	45	60	85
Physical Examination	54	65	80
Progress Note	28.9	50	79
Discharge Summary	39	55	90
Medication Sheet	21	45	88
Computer Sheet	46	50	59
Clinical Impression	39.9	60	82
Order Sheet	35	50	77
Total	**38.6**	**60.6%**	**80%**

BEFORE - prior to implementation, PILOT 1 - after implementing solutions 1 - 3, PILOT 2 - after implementing solution 4.

Due to the lack of time, the impact of improving health records on patient satisfaction and reducing expenditure was not studied adequately enough, although the results were significant. Before implementation, patients' families were called days after discharge to collect discharge summary; but after implementation the patients were able to collect such papers on the day of discharge.

Recommendation for Continued Improvement

The team recommends establishing a patient file audit at least once every three months, improve communication skills and set up proper connecting channel between our department and Medical Record Department. Establishing a regular orientation program for the fresh graduate, preparing written guidelines on health record keeping and conducting other projects will improve quality and increase patients' satisfaction.

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Improving the Efficiency of Communicable Disease Notification System

Problem Statement

Complete and timely reporting of all cases of communicable diseases diagnosed in a country are two essential factors of any surveillance system's efficiency and effectiveness. The surveillance system in Bahrain is an integral part of Communicable Diseases Section (CDS) at Public Health Directorate (PHD). By law, all hospitals, health centers and private clinics have to notify to the CDS of any case of certain communicable diseases, which are classified into Group A and Group B. It was observed that cases of communicable diseases seen at health centers are not reported to CDS directly. Instead, CDS know about these cases from Public Health laboratory or Salmaniya Medical Center, when it is sometimes late for taking preventive or control measures. The aim of this project is to improve the efficiency of the Communicable Diseases Surveillance System.

The table below shows the number and percentage of registered cases that were notified by health centers before the intervention in 1999.

Diseases	No. Registered cases	No. Notified cases	% Notified cases
Measles	18	6	33.3
Viral Hepatitis-A	47	4	8.5
Viral Hepatitis-B	6	6	100.0
Pulmonary T.B	3	2	33.3

Root Cause Analysis

Brain storming session took place to identify the cause of the problem. In the Primary Health Care, the patient load is 60-100 per doctor per day, preventing doctors from keeping up with filling of the notification forms. Doctors' lack awareness about the notification procedure steps. There is no proper coordination from the Public Health regarding the procedure standard. Feedback on results and lack of follow-up are important factors of the problem. Majority of health centers (98.8%) have disease registers; they were neither complete nor used efficiently for notification. Only 43% of the doctors follow the system of immediate reporting for certain group-A diseases. Majority of doctors have not seen or received the CDS 4-weekly report.

Alternative Solution

We considered driving and restraining forces to discuss alternative solutions. The following three alternative solutions were presented and discussed.

1. Sending a reminder to all health center doctors about the importance of reporting infectious diseases cases to CDS.
2. The public health inspectors visit the health center doctors regularly.
3. Long-team comprehensive solutions:
   It is the one that was agreed upon and steps were put to implement it. The solution includes the following measures.
   a) Preparing a notification procedure guidelines in text and graphics.
   b) Procure a stamp for every doctor "REPORT TO PUBLIC HEALTH".

c) Register book in every health center under the care of the nurse-in-charge.
d) Active Surveillance.
e) Communication between Public Health, physicians and nurses.

Implementation

Public Health Inspectors, Primary health care doctors and other concerned persons are familiarized about their roles on the implementation of the project. Necessary materials like stamps and registration books were distributed and procedure guidelines were circulated to all health centers. The start off date was to be 2000.

Result

Two months after the implementation of this plan (October and November 2000), significant improvement was noticed in reporting of Viral Hepatitis-A (8.5% to 35.7%). The table below shows the reporting of certain diseases following the intervention.

Diseases	No. Registered cases	No. Notified cases	% Notified cases
Measles	0	1	Excellent
Viral Hepatitis-A	14	5	35.7
Viral Hepatitis-B	2	2	100.0
Pulmonary T.B	3	0	0.0

Recommendation for Continued Improvement

This project is an important step to further improve the efficiency of Communicable Diseases Section programs. Since the target of 100% notification is not yet achieved, we believe that communication and teamwork will help find appropriate solution and accomplish better results.

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