A MANAGEMENT INFORMATION SYSTEM FOR MEDICAL SERVICES AT COMMAND HEADQUARTERS

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ABSTRACT

Management information system (MIS) is increasingly being used for information storage, handling, processing and retrieval of data for improving the services provided by any organisation. It allows quick decision making for overall functional improvement. Headquarters Central Command (Medical) Lucknow has developed software for data capturing in respect of six important functional areas. These include employability and availability of specialist officers, assessment of hospital services through functional update and monitoring team (FUMTs), patient satisfaction survey, user commanders opinion, state of critical items of hospital clothing and modernisation of hospitals. This automation has resulted in quick and scientific decision making for improving the medicare services to the clientele.

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KEY WORDS : Management information system; Software; Medical decision making; Medical staff.

Introduction

Automation and management of data have made rapid advances all over the world. Almost every field of human endeavour has been invaded by computers. Application of computers in health sector has increased phenomenally all over the world for many reason including labor saving, improved monitoring of functioning of hospitals and enhanced patient care and better planning [1]. In the Armed Forces, the automated MIS is operating since long though confined only to selected centres and subjects. In the medical field, no comprehensive software has been developed for use at Command Headquarters level so far which would help in quick information, decision making and follow up measures.

Hospitals form key centres for delivering satisfactory medical care to the clientele and in recent years both the technology of medical care and the organisation of health care delivery systems has changed [2]. There is an increased stress on checking quality of the service based on consumer feed back [3]. Acces-

sibility, patient satisfaction and scientific effectiveness are parts of quality of medical care. Central Command covers a vast geographical area with 27 military hospitals with almost 27 percent of army's hospital beds. Monitoring, controlling, coordinating and supervising such a large medical organisation has its own problems because of incomplete, delayed and at times incorrect data availability. In order to deliver a satisfactory medicare, quick and scientific decision making is essential which is directly dependent on reliable, valid and relevant information available within a specified time frame. For this one has to make use of computer based methods of information storage, handling, processing and retrieval [4]. There has been a need to develop a responsive MIS for medical branch of Headquarters Central Command to cope with the information load and to facilitate effective decision making at various levels.

Material and Methods

The aim has been to identify the information needs of medical branch of Command

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Headquarters related to some important aspects of patient care and develop a practical MIS, which will ensure timely availability of required information in the desired mode for effective and efficient decision making. The development of system was undertaken by a team of officers from College of Defence Management, Secunderabad. The functional areas needing automation and decision centres were identified by Deputy Director Medical Services (DDMS) and other staff of medical branch. The methodology involved in development of the package was based on :

- a) Review of the existing information system of the medical branch.
- b) Analysis to establish linkages, in terms of information exchange, with other agencies at Command Headquarters as well as other organisations.
- c) Identify functional areas and information needs related to patient care for effective decision making.
- d) Rationalise methods of data capture, storage and retrieval.
- e) Design and lay down specification and file structure.

Functional Areas for Automation

Six major functional areas were identified for MIS to generate information for Army Commander and Deputy Director Medical Services for making necessary decisions to provide satisfactory medicare to the clientele. In order to trigger these activities, decision and information needs of these functional areas were identified and analysed. These areas were :

- a) Planning employability of specialist officers.
- b) Assessment of hospital services.
- c) Assessment of hospital services by user commanders.
- d) Assessment of satisfaction level of patients.
- e) Monitoring state of critical items of hospital clothing.
- f) Modernisation of hospitals.

Results

Details of specialist officers speciality and hospital-wise and their availability have been included in the system and the file is updated every month. The output generated is as per Table 1.

TABLE 1
Format of Specialists Officers file

Personal No	-	MR-02082Y
Rank	-	Colonel
Name	-	PN Kapoor
Unit	-	CH (CC) Lucknow
Formation	-	HQ Central Command
Speciality	-	Medicine
Class	-	Senior Adviser
Qualifications/Courses	-	MD(Med), MAMNS, MOJC, MOSC,....
Availability	-	Yes
Leave programme starting	-	01 Jun 94
Leave programme ending	-	30 Jul 94
Date of update of file	-	31 Mar 94

All 27 military hospitals in the command have been included for assessment of hospital services. The assessment is evaluated by independent functional update and monitoring teams for each hospital every six months and is based on a pre-structured 14 parameters schedule laid down by Medical Directorate (Table 2). The output generated indicates hospitals above, equal to, or below a particular grade.

User commanders forward a six monthly report on scheduled parameters as developed for the numerical grades and hospitals are graded as excellent, good, satisfactory or poor on a 100 point scale.

The response of a random sample of patients to various parameters as developed in a survey instrument for outdoor and indoor patients is quantified. The scale for various grades of responses by patients has been defined in the questionnaire. The final parameters for outdoor and indoor patients as developed in the software are as given in Table 4

TABLE 2

Assessment of hospitals by FUMTs**Hospital : CH(CC) Lucknow****Parameters with Weightage Factors 1 - 9 Scale**

Professional competence level	7
Formulation of SOPs	7
Adherence and enforcement of SOPs	7
Resource availability and utilisation	7
Ward management	8
Hospital maintenance system and methods	7
Emergency services	7
Staff behaviour towards patients	7
Dietary services, its variety and effectiveness	8
Innovation/plan implementation	7
Personal management	7
Patient satisfaction assessment	7
Discipline of hospital staff	7
Complaints, how these are received and processed	7
Overall assessment	8
Overall grading	
Excellent 8-9,	
Good 6-7	
Satisfactory 4-5,	
Poor 3 and below	

and 5 respectively.

Thirteen items of hospital clothing have been identified to be critical use in patient care. A deficiency of 25% and above is considered critical. The data captured includes hospital wise details as per Table 6.

The software developed for modernisation of electromedical equipment of hospitals includes details of electromedical equipment as given in Table 7..

Discussion

So far the Medical Branch has only a file containing information of specialist officers specialitywise which requires updating their availability and employability. Their leave programme and temporary moves are regulated accordingly. This system is not only time consuming but is also not very dependable. In the present MIS developed by us, the output generated by the programme helps the Deputy Director Medical Services in taking timely decision in employing the specialists officers in the command as well as for certain

TABLE 3

Assessment of hospital services by user commanders**Hospital : CH (CC) Lucknow Half year ending Dec 93 Stn/Formation****Parameters with weightage factors**

	Reception	Staff behaviour	Availability of drugs	Engineering services	Supportive services	Support by commander	Total score	Grade
Max score	10	20	20	15	25	10	100	
Score of CH (CC)	8	15	20	10	20	10	83	E

(Excellent - 80, Good 60-80, Satisfactory 40-60 , Poor 40 and below)

TABLE 4

Patient satisfaction - Outdoor patient grading**Hospital : CH (CC) Lucknow****Parameters with weightage Factors**

	Interaction with MOs	Performance hosp services	Behaviour of staff	Reception and documentation	Performance utility services	Total score	Grading
Max Score	30	25	20	15	10	100	
Score of CH (CC)	29	20	19	13	9	91	Excellent

(Excellent-80, Good 60-80, Satisfactory 40-60, Poor 40)

TABLE 5
Patient satisfaction - Indoor patient grading
Hospital : CH (CC) Lucknow
Parameters with weightage factors

	Professional attention	Nursing care	Dietary services	Hospital physical services	Total score	Grading
Max score	40	30	20	10	100	
Score of CH (CC)	38	29	19	9	95	Excellent

(Excellent - 80, Good 60-80, Satisfactory 40-60, Poor - 40)

TABLE 6
Format of hospital clothing file

Name of hospital	- CH (CC) Lucknow
Name of item	- Blanket Hosp Black
Cat Part No	- KC 7210-000008
A/U	- Nos
Qty authorised	- 1572
Critical level (more than 25% deficient)	- 1179
Holding by hospital in previous quarter	- 1572
Holding by hospital in current quarter	- 1572
Deficiency in percentage	- 4%
Supply Depot	- OD Allahabad
Date of update of file	- 31 Mar 94

TABLE 7
Format of modernisation equipment file

Name of hospital	- CH (CC) Lucknow
Name of equipment	- Cardiac resuscitator with Defibrillator
Unit cost	- Rs. 2,38,000/-
Quantity	- one
Procured	- No
Planned for 1994-95	- Yes
Date of update of file	- 31 Mar 94

specific assignments. This was effectively utilised in preparing specialist teams for relief during earthquake in Latur as well as for selecting officers for medical teams to Nepal and Somalia.

The output generated by the programme for assessment of hospitals enables the Army

Commander and Deputy Director Medical Services to effectively monitor hospital services and identify hospitals below the desired standards and accordingly issue necessary instructions for improvement in areas showing unsatisfactory performance. The output of previous six months can be compared, so also the yearly grading is available for comparison.⁶

Assessment of hospital services by user commanders brings in objectivity in the overall assessment. This reflects the medicare facilities provided, the behaviour of medical and para medical staff, waiting period, reception and guidance for patients, dietary standards, and maintenance of physical facilities in the hospitals. The output is directed towards improvement in medicare by involving the local administrative authorities.

Patient satisfaction survey reflects the quality of medicare provided by the hospitals. Patient satisfaction in any hospital depends on two vital factors viz. medical care and hospital supportive services like dietary, linen, engineering services and general hospital environment. The impression on patients of these non-medical factors plays an important role in overall patient care [5]. The software developed has grouped the response to five main parameters in case of out patients and four in case of indoor patients. The system as developed displays rating of all hospitals of Central Command separately for outdoor and indoor patients for the current half year, previous half year and annual grading.

This leads to identification of hospitals showing unsatisfactory response and can further display different parameters which have resulted in lower grading. The decision maker can then take appropriate action for improvement of patients satisfaction by informing the concerned hospital and taking remedial measures. Any area which requires special attention like reception and guidance, waiting period, behaviour of staff, level of supportive hospital services in the form of water supply, dietary, linen, general cleanliness and so on can then be attended to. It is well established that a general factor like improvement in patient reception can raise the morale of the patients [6].

A three dimensional comparative rating of hospitals as assessed by *FUMT*, user commanders and patient satisfaction survey for each hospital has also been developed so that a composite, unbiased and realistic assessment is available to decision makers for initiating remedial measures for overall improvement of medical services. The quarterly output on hospital clothing is analysed and ordnance branch at Command Headquarters as well as the supplying depot is intimated the details of the deficiencies for making good the same at the earliest. Reasons for any hospital showing unusual high wastage level of any item can also be investigated and remedial measures undertaken.

Modernisation of military hospitals is a major thrust area at present. It is essential that available funds are utilised for the maximum benefits. A modernisation plan for all hospitals in the command has been finalised and priorities worked out. Presently there is a plethora of reports and returns on the subject with resultant inadequate planning, procurement and monitoring. Automation has helped in processing the cases faster and more logically. This helps in closer monitoring of modernisation state of our hospitals

with the available funds.

The MIS developed by medical branch of Central Command is being utilised and regular outputs generated by the system are analysed and follow up instructions issued to formations, hospitals and other agencies for improvement of medicare services. This has not only proved to be saving on work load of clerical staff but correct and complete data availability on flick of a computer button is ensured to the decision makers with resultant improvement in effectiveness and efficiency of medical services as a whole. Present MIS covers only a few basic facets dealing with key areas affecting medicare. Although there are many more information needs required at Command HQ, it has also not been feasible to evaluate results which will be done only after data for a substantial period is compiled. It is recommended that this MIS should be adopted by all Command Headquarters so as to bring uniformity in collection, compilation, processing and retrieval of data for overall improvement in delivery of medicare to our clientele.

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