

## Performance improvement indicators of the Medical Records Department and Information Technology (IT) in hospitals

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### SUMMARY

Medical Record Department (MRD) has a vital role in making short and long term plans to improve health system services. The aim of this study was to describe performance improvement indicators of hospital MRD and information technology (IT).

**Collection of Data:** A search was conducted in various databases, through related keywords in articles, books, and abstracts of conferences from 2001 to 2009. About 58 articles and books were available which were evaluated and finally 15 of them were selected based on their relevance to the study. MRD must be capable of supporting tasks such as patient care and continuity, institute management processes, medical education programs, medical research, communication between different wards of a hospital and administrative and medical staff. The use of IT in MRD can facilitate access to department, expedite communication within and outside department, reduce space with electronic medical records, reduce costs, accelerate activities such as coding by use of coding guide software and facilitate retrieval of records that will ultimately improve the performance of MRD.

**KEY WORDS:** Information Technology, Indicator, Medical Records, Performance.

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### INTRODUCTION

Medical Records Departments (MRD) in the hospitals are supposed to have complete records of patient's admission. Medical Records (MR) documentation in accordance with predetermined standards; medical information coding process; creation and maintenance of statistical information database for planning and budgeting for hospitals;

organizing outpatient and emergency medical records.<sup>1,2</sup> Some deficiencies in hospitals MR performance necessitate the ever increasing use of information technology (IT). Deficiencies such as poor performance on patients' admission and issuance of compiled instructions; lack of appropriate standard archive; weakness in informing referrals to MRD; incomplete records tracking system; incomplete MR coding; lack of effective and efficient use of information and records retrieval just to mention a few.<sup>3-4</sup>

The question arises that how IT can improve the performance of medical records? The aim of this manuscript was to describe performance improvement indicators of the MRD of hospitals and IT through unsystematic review.

### METHODS

This study was divided into three phases: literature collection, assessing, and selection. The study was conducted by searching in a number of available databases such as Direct, PubMed, Proquest, Springer, Google, and SID through

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keywords of information technology, medical records, performance improvement, performance assessment, and indicators in texts and abstracts of articles, books, and proceeding in conferences from 2001 to 2014. About 59 articles and books were found and evaluated of which finally 15 cases were selected based on their relevance to this study.

## RESULTS

The benefits and IT applications in health system can be referred to empowering employees, the exchanging possibility of information between health care institutions, medical ethics, efficiency and effectiveness, online education, communication between patients and doctors, increasing geographic range of health services and health, increasing the health services quality and also increasing access to judicial services. Information Technology in healthcare department has provided many facilities such as obtaining information, medical advice and remote health for human society.<sup>5</sup> MRD is also referred to as the hospital information pulse, has high potential for greater use of IT.<sup>1</sup> Today IT in MRD is not only a competitive advantage, but it is

also seen as a competitive necessity. IT applications can affect the performance improvement of MRD; applications such as quick responding to clients and staff by use of IT and hospital information management system, reduction of clients waiting time, increasing MR maintenance quality by electronic or scanned Medical records, enhancing security and confidentiality of information using access levels for each user allowed to use the system, information sharing through network and internet between different parts and in higher levels between hospitals which will lead to knowledge sharing and help medical education and research advancement, reduction of the costs using paperless system and reducing the space occupied by the paper MR and many other applications. Unlike the benefits and advantages mentioned above, some cases can be noted that lead to lack of proper implementation of IT in hospitals; such as attitudinal and behavioral constraints of staff, lack of technical infrastructure and software commensurate with performance, lack of funds by administrators to implement electronic health records, lack of proper technical support, and lack of experts.<sup>6-9</sup>

Table-I: Indicators of performance assessment of MRD in different studies.

| <i>Researcher (year)</i>         | <i>Units or departments</i> | <i>Indicators of performance assessment</i>   |
|----------------------------------|-----------------------------|---|
| Ajami et al., 2012 <sup>12</sup> | Admission                   | A: human resources- experience, education, and social relations; B: equipment; C: admission site and space; D: client satisfaction; E: processes  |
|                                  | Archive                     | A: human resources, experience, education; B: site and space of archive unit; C: equipment; D: client satisfaction; E: contents of MR including structure and content; F: security measures such as confidentiality, crisis management, processes   |
|                                  | Coding Statistics           | A: human resources; B: equipment; C: client satisfaction; D: processes<br>A: human resources including number of employees, experience, education; B: equipment; C: client satisfaction; D: processes   |
| Ajami et al., 2010 <sup>13</sup> | Admission                   | A: amount of client satisfaction, number of clients, amount of other staff satisfaction from admission, amount of complaints from admission; B: average waiting time of clients, number of methods for giving information to clients; C: training per employee, ratio of admission approvals to overall approvals of committee of medical documents, ratio of implemented legislation to overall approvals of internal meetings; D: turnover index of beds, occupancy index of beds   |
|                                  | Coding                      | A: number of formal clients for research; B: average registered code, average time of coding, average time of index, rate of error in coding; C: time of training documentation to doctors, coding training for technician, number of books; D: allocated financial-administrative credit   |
|                                  | Archive                     | A: number of formal clients, average time of responding official clients, number of informal clients, average time of responding informal clients, amount if complaints from MRD; B: number of files with empty forms; existing deficiencies in MR, existing deficiencies in MR according to type of the deficiency, time needed for file recovery, rate of compliance with safety standards; C: professional training, MR training capita for medical staff, ratio of MR approvals to overall approvals of committee of medical documents, ration of implemented legislation to overall approvals of medical documents committee, amount of correct usage of terminal digit system; D. amount of Rial credit for MRD, deductions due to incomplete Medical records, time required for billing records, time interval between discharge ordering and settlement |
|                                  | Statistics                  | A: Satisfaction of provincial statistic headquarters; B: average hours spent on internet usage, statistics training capita, average error reported in statistics reports; C: average hours spent on internet, training capita, percentage of statistic approvals to overall approvals of economic and statistics assessment committee.  |

**Characteristics of favorable indicators:** Developed performance assessment indicators should possess characteristics of a SMART & D system (SMART & D: Specific, Measureable, Achievable, Realistic, Time Frame, and Database).<sup>10</sup> Indicators need to be meaningful, up-to-date, evidence-based, and repeatable while they are able to support assessment. Performance key indicators lead to

Table-II: MR Performance Assessment Indicators.

| <i>Critical performance indicator</i>                                | <i>Indicator</i>  | <i>Numerator</i>  | <i>Denominator</i>                                       |
|--|---|---|--|
| Learning and growth  | Ratio of professional staff MR  | Number of MR professional staff                                 | Number of staff based on chart                           |
|  | Average training courses  | Training courses held   | Number of courses needed                                 |
|  | Percentage of trained staff to all staff employed in MR                               | Number of trained staff   | All MR staff   |
|  | Ratio of documentation principles workshops to all training courses                   | Number of workshops held on documentation principles            | Overall number of courses held                           |
|  | Percentage of staff who have passed general courses based on validation measures      | Number of employees who have spent general courses              | Overall number of staff                                  |
|  | MR committee meeting in accordance with guidelines                                    | Number of sessions  | Overall number of meetings based on guidelines           |
|  | Ratio of training courses held for users in order to use system and software programs | Number of sessions held to train how to use system and software | Overall number of training courses held                  |
|  | Process   | Amount of file deficiencies MR information                      | Number of deficient medical MR in a specific time period |
| Amount of deficiency elimination                                     |   | Number of MR whose deficiency was eliminated                    | Overall number of deficient MR in a specific time period |
| Amount of file deficiencies based on documentation group             |   | Number of file deficiencies based on documentation group        | Overall number of MR discharged                          |
| Accuracy of MR archive   |   | Number of MR archived correctly                                 | Overall number of MR archived                            |
| Average coded MR in a specific time period                           |   | Number of MR coded in a specific time period                    | Number of patients discharged at the same time period    |
| Percentage of statistical reports provided in a specific time period |   | Number of statistical reports provided                          | At the same specific period                              |
| Percentage of MR errors  |   | Number of errors in MRD   | To overall number of hospital errors                     |
| Quality of services  |   | Average waiting time of patients for admission                  | Patients' waiting time for admission                     |
|  | Percentage of clients in MRD  | Number of clients   | Overall number of hospitalized patients                  |
|  | Average time for file recovery  | Time spent for file recovery                                    | Number of MR recovered                                   |
|  | Average time for MR filing  | Time spent for filing   | Number of filed MR                                       |
|  | Percentage of visits made to expected visits  | Number of visits made   | Overall expected visits                                  |
| Client satisfaction  | Timing of admission for hospitalized patients   | Time spent for admission  | Overall number of hospitalized patients                  |
|  | Average time for answering the clients  | Time taken for answering the clients                            | Overall number of clients                                |
|  | Clients' satisfaction from MRD  | Score of checklist  | Number of completed checklists                           |
|  | Percentage of received complaints regarding performance of MRD                        | Number of received complaints regarding performance of MRD      | Overall number of hospital patients                      |
| Security and confidentiality   | Security of information in case of a problem  | Number of lost information                                      | Overall information in HIS                               |
|  | Software alarming in probable case of error in HIS                                    | Number of alarms given in case of error in HIS                  | Overall alarms given by HIS                              |
| Costs  | Ratio of archive space in the hospital to standard space                              | Amount of physical space for archive                            | Standard archive space                                   |
|  | Ratio of archive space to overall space of hospital                                   | Amount of physical space for archive by meters                  | Overall space of hospital                                |
|  | Costs of equipment and IT in MRD  | Costs spent on equipment and IT in MRD                          | Overall costs allocated to MR                            |

promotion of user systems accountability and provide opportunities to compare organizations. Increased awareness of quality and safety in healthcare shows the importance of performance and quality assessment even more.<sup>11</sup>

If documentation follows standard quality and quantity, Medical Records are reduced and patients' health is guaranteed. This important objective is achieved through application of IT in processes and MR staff which lead to improved communication, increased productivity, developed and continuous information sharing between hospitals, health centers, doctors, and patients. To identify performance indicators of MRD, the indicators mentioned in different studies are mentioned in Table-I.

As explained in Table-I, various methods and indicators have been used for assessment of MRD by different researchers. However, due to lack of developed indicators there is lack of standardization and proportional performance measures related to activities of MRD. In this study, performance assessment indicators have been selected with the help of previous studies (Table-II).

In this study, critical performance indicators of MRD were studied under seven main categories of learning and growth, process, service providing, client satisfaction, security and confidentiality, and costs along with their performance indicators based on each department and its responsibilities as well as calculation formula. Zhang has indicated client satisfaction as a principle for using IT based on high quality performance.<sup>14</sup> Given above critical indicators, IT can be useful in improvement of performance assessment results.<sup>15</sup>

## CONCLUSIONS

Promotion of Medical Records indicators along with identification of developed performance indicators which include all activities of four units in MRD can affect quality of healthcare services. Employees need both technical and communicative skills in order to improve their performance. This goal can be only achieved through knowledge, expertise, and training. Financing hospitals or participation of private sector, proper technical support from information systems, and presence of experienced experts who are able to deal with software and hardware problems will be greatly effective in successful usage of information technology.

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## Authors' contribution:

**Dr. Sima Ajami and Miss. Fatemeh Torabiyani:** Collection of data writing, editing the manuscript and approved the final manuscript for publication.  
**Dr. Saedah Ketabi:** Critical review and approval of the final manuscript for publication.