Original Article

Evaluation of organizational maturity based on people capacity maturity model in medical record wards of Iranian hospitals

Mohammad H. Yarmohammadian, Nahid Tavakoli, Assadollah Shams¹, Farzaneh Hatampour²

Health Management and Economics Research Center, ¹Department of Medical Information and Records Management, ²Borakhar Health Center, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Context: People capacity maturity model (PCMM) is one of the models which focus on improving organizational human capabilities. **Aims:** The aim of this model's application is to increase people ability to attract, develop, motivate, organize and retain the talents needed to organizational continuous improvement. **Settings and Design:** In this study, we used the PCMM for investigation of organizational maturity level in medical record departments of governmental hospitals and determination strengths and weaknesses of their staff capabilities. **Materials and Methods:** This is an applied research and cross sectional study in which data were collected by questionnaires to investigation of PCMM model needs in medical record staff of governmental hospitals at Isfahan, Iran. We used the questionnaire which has been extracted from PCMM model and approved its reliability with Cronbach's Alpha 0.96. **Statistical Analysis Used:** Data collected by the questionnaire was analyzed based on the research objectives using SPSS software and in accordance with research questions descriptive statistics were used. **Results:** Our findings showed that the mean score of medical record practitioners, skill and capability in governmental hospitals was 35 (62.5%) from maximum 56 (100%). There is no significant relevance between organizational maturity and medical record practitioners, attributes. **Conclusions:** Applying PCMM model is caused increasing staff and manager attention in identifying the weaknesses in the current activities and practices, so it will result in improvement and developing processes.

Key words: Iranian hospitals, medical record department, organizational maturity, people capacity maturity model

Address for correspondence: Prof. Mohammad H Yarmohammadian
Health Management and Economics Research Center,
Isfahan University of Medical Sciences, Isfahan, Iran.
E-mail: yarmohamadian@mng.mui.ac.ir

INTRODUCTION

Most organizations try to gain more maturity in their gradual evolution process. A high percentage of these organizations use capacity maturity models to plan their future for a better preparation and prosperity.[1,2] People capability maturity model (PCMM), which is developed by Karngi Melon University, helps organizations to need assess their organizational maturity, increase their human resources capacity and address their critical people issues. Since an organization cannot apply all workforces strategies in short term, PCMM provides a step by step approach.[3-5]

PCMM focuses on developing organization human skills, especially their ability in developing information skills. Purpose of PCMM in organizations is to develop the ability of the organization to attract, expand, motivate, organize and maintain necessary capacities to develop information skills.[6-10]

Five levels of PCMM frameworks are introduced below:
1. *Initial level*; typical characteristics: lack of coordination in performances, displacement of responsibilities, prevailing formalities, dividing workforces based on emotions and palates
2. *Managed level*; typical characteristics: Working more than enough, environmental distractions, unclear performance objectives or feedback, lack of related knowledge and skills, weak communication, low morale
3. *Defined Level*; even though main executive performances related to the workforces exist, the how recruiting them in units is not adjusted and there is little synergy in the organization to do things. The organization misses the opportunities to standardize performances of its workforces because knowledge and skills to guide job activities are not defined well
4. *Predictable Level*; the organization can predict its performances, because it can quantitatively determine the capacities of its workforces and can make the process of qualifications, which are applied in performing their assignments
5. *Optimizing Level*; all the organization is focused on continual improvement. The organization uses the established results of the quantitative management activities at maturity level 4 to progress in level 5. Organizations with level 5 maturity face change management like an ordinary business process that should be dealt with in accordance with past procedures and based on principles.[4,11,12]

In a study on experiences of applying PCMM by Software Engineering Institute the results showed that the merits of applying PCMM depends on the achieved level of maturity. Organizations that achieve level 2 of maturity report increase in ethical principles of workforces and decrease in discretionary job changes.[13-15]

Health organizations and especially hospitals among others are certainly of great importance. One of the features of health service organizations is that their raw materials are human beings. In medical services, the aim is to provide care services to those who need.[16,17] In these organizations, information is the basis of decision-making and planning and patient's medical records are the primary source of health care information. Medical records, either manual or automatic, include patient medical information which is all dimensions of patient care. All medical team and hospital authorities need this information; and personnel of medical records departments have the main role in collecting, processing, saving and searching patient health information.[18]

Managing health information system requires recruitment of professional workforce and medical records managers and health information managers and working staff of various units of medical records department. It means that the activities of people working in medical records departments are of special significance to patients and health care institutions. Medical records department include units of reception, disease coding, medical archiving, and hospital statistics and it has close relationship with most hospital wards.

The medical record department is one of the most important departments in hospitals because its purposes are to provide services to patients, doctors and hospital managers and to provide educational and research services and maintain the quality of health services and patients' rights and follow standards. Without effective and efficient management, achieving these purposes will be very difficult if not impossible and will require a lot of time and expenses.[19, 20] Management is a term for the process of decision making, planning, organizing, leading and controlling financial, information and human resources to achieve goals effectively and efficiently. Planning is the primary function of management. Needs assessment is the first and fundamental step in any system planning.[21] Assessing important needs are a basis to determine goals and provide suitable background for organizing other elements. All decisions to achieve specific goals, suitable educational content and effective use of resources and financial, material and human facilities depend on needs assessment studies.[22]

Medical record department is responsible for medical documents of health care team and to maintain and protect medical files thoroughly and precisely to provide basis for logical decision making of hospital managers all its personnel should continuously develop their skills in various levels. Medical records personnel in hospitals need to continuously develop their skills in various levels because they deal with information and data systems and are responsible for privacy, protection and process of these data. PCMM provides this opportunity for the organizations to assess the level of their workforce abilities and skills, determine their level of maturity and develop the features of their personnel and hospital units to achieve higher maturity level. Therefore, this study aimed to use PCMM for the needs assessment of capacity levels of human skills in medical records departments of public hospitals of Isfahan. It aimed to determine personnel's level of knowledge, skills and processing abilities of the personnel and their abilities to use these skills to improve their job performance and to determine the strengths and weaknesses of the organization in attracting, developing, and motivating, organizing and developing hospital personnel's skills. As it was mentioned, this model has 5 levels, and in this study the needs assessment for maturity levels of one and two of the medical record personnel in public hospitals of Isfahan was studied using a questionnaire.

MATERIALS AND METHODS

This is a cross-sectional and descriptive study.[23] The study population included personnel of medical record departments of the public hospitals of Isfahan. One of the hospitals did not cooperate with the researcher based on the internal policies and was omitted from the study. The entry criteria included holding at least a college degree in medical records and 3 years of management experience in medical records department (the head of the department or reception

unit, medical records, archiving and statistics). Out of all medical records personnel, 34 people had the entry criteria. A standard questionnaire was used to collect data. The questionnaire was taken from the second edition of "People Capacity Maturity Model" book (2001) and is accessible from SEI website.[24] The validity of the questionnaire was determined by professionals' opinions. The model includes 5 level of maturity and the questionnaire investigates two of these levels. Level 2 includes 6 process areas and the questionnaire also is based on 67 practice and key activities of these areas. Level one of maturity is not included in the questionnaire, because according to the PCMM, organizations that have not achieved any of the process areas of level 2 perform as organization in maturity level one. The reliability of the questionnaire was approved by Cronbach's alpha of 0.96. Data collected by the questionnaire was analyzed based on the research objectives using SPSS software and in accordance with research questions descriptive statistics were used.

RESULTS

Demographic data of participants are presented in Table 1.

After analyzing the results of the questionnaire, Table 2 including the mean scores of hospitals in each process area of managed levels of the model was developed by the researcher.

As the table shows, none of the studied hospitals are in level one of maturity. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the managed level of PCMM is 35, as the table shows. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the staffing process area of the managed level is 45. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the communication and coordination process area of the managed level is 38.

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the work environment process area of the managed level is 27. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the performance management process area of the managed level is 40. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the training and development process area of the managed level of is 28. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the compensation process area of the managed level of is 29.

The strength of hospitals number 1, 6, 11, 12 and 13 is in their performance management area, while it is staffing process area for hospitals 3, 4, 5, 7, 8, 9, 10, 14, 15, 16 and 17 and it is communication and coordination for hospital number 2. The weakness of hospitals number 1, 4, 5, 7, 11, 13

Table 1: Frequency distribution of participants' demographic data (percentage)	
Participants' demographic data	Frequency distribution (*N*=34)
Age (year)	
30-26	16 (47.1)
34-30	8 (23.5)
38-34	6 (17.6)
42-38	4 (11.8)
Sex	
Female	21 (61.8)
Male	13 (38.2)
Major	
College degree in medical records	15 (44.1)
Bachelor degree in medical records	16 (47.1)
Master degree in medical records education	3 (8.8)
Working history	
3-6	12 (35.3)
9-6	10 (29.4)
12-9	5 (14.7)
15-12	3 (8.8)
18-15	4 (11.8)
Affiliation	
Coding unit	8 (23.5)
Reception unit	7 (20.6)
Archiving unit of medical records	7 (20.6)
Position	
Head of medical records department	12 (35.3)
Head of statistics and medical records	15 (44.1)
Expert in medical records	10 (29.4)
Head of reception and medical records	9 (26.5)

and 17 is in training and development process area, while it is in compensation process area for hospitals 2, 6, 14, 16 and is work environment for hospitals 3, 8, 9, 10, 12, 14 and 15 and is staffing area for hospital 13.

DISCUSSION

Data analysis showed that, None of the hospitals in the study were in level one of maturity. If there is any practice or activity not used in a unit in any of the process areas of medical records wards of the hospitals, the questionnaire consider that in "very little" according to Likert scale and the score would be 1 for it. Since the questionnaire included 67 questions in 6 process area, if the mean score of a unit personnel's skill in a hospital is equal to or less than 11, that hospital would be in level one of maturity. Table 1 show that the mean score of process areas in none of hospitals in this study was 11 or less. Therefore, the personnel of medical records departments on these hospitals were not in level one maturity.

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the managed level of PCMM is 35, as Table 2 shows. Since level 2 of the model includes 67 practices and activities and Likert scale is used in the questionnaire, if these processes

Table 2: The mean of total score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in managed level

Hospital name mean score	Staffing process area	Communication and coordination process area	Work environment process area	Performance management process area	Training and development process area	Compensation process area	Mean score (%)
1	29	25	21	31	18	21	24 (43.63)
2	31	51	31	39	37	30	36 (65.45)
3	61	45	32	40	34	34	41 (74.54)
4	35	24	21	26	19	20	24 (43.63)
5	42	33	28	38	25	27	32 (58.18)
6	30	32	33	40	32	14	30 (54.54)
7	42	29	16	28	11	25	25 (45.45)
8	45	33	22	37	27	32	33 (60)
9	57	46	31	40	34	36	41 (74.54)
10	79	55	42	60	45	50	55(100)
11	36	35	22	39	19	22	29(52.72)
12	37	38	26	39	33	36	35(63.63)
13	26	42	33	43	26	30	33(60)
14	55	44	33	49	35	33	42(76.36)
15	62	45	24	47	33	36	41(74.54)
16	46	36	24	35	30	21	32(58.18)
17	56	38	29	44	27	35	38(69.09)
Total	45	38	27	40	28	29	35(63.63)

are thoroughly used, the mean of total score would be 56. Therefore, the mean of 35 shows those personnel's abilities and skills in the medical records wards of public hospitals of Isfahan is average. The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the staffing process area of the managed level is 45. Staffing area includes 16 practices and activities and the maximum mean of it is 80. Mean 45 (56.25%) out of 80 (100%) shows that personnel's abilities and skills in the medical records wards of public hospitals of Isfahan is average in this area as well.

A comparative study of the methods of recruitment and employment in different countries found that the quality of performance in any organization highly depends on the quality of personnel working there and are responsible for doing their duties. Choosing qualified people and keeping them in the organization is vital for achieving goals in any organization.[24,25] The results of a study by Becker, which used this model, showed that there is a high correlation between the improvement of workforces performance and the financial performance, as well as decrease of transfers and resignations of the personnel SEI website.[24] The results of these studies approve the necessity for application of a model to improve staffing process and the importance of having strategies and guidelines for activities related to the staffing in units.

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in process area of communication and coordination of the managed level is 38. The process area of communication and coordination includes 11 practices and activities with a maximum mean of 55. The mean score of 38 (69.09%) out of

5-5 (100%) maximum score is almost a good score. Hospital number 10 with 55 score was the highest and hospital number 4 with score of 24 was the lowest in this level. The aim of the communication and coordination process is to assure on time communication throughout the organization and to assure that the workforces have necessary skills to distribute information and coordinate activities effectively.[24]

A study on the effects of administrating automation systems on some areas of organizational Communications showed that the existence of such system had positive effects on inter-organizational communications and increased connection channels and their speed and facilitated organizational relationships.[26]

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the process area of work environment in the managed level of is 27. The work environment includes 9 practices and activities with a maximum mean of 45. The mean score of 27 (60%) out of 45 (100%) maximum score is an average score. Hospital number 10 with score 42 had the highest score in this area compared to other hospitals and hospital number 7 with score 16 had the lowest mean score in this level. Also, according to the results of the study, most personnel said that there is no physical space in their unit to be used for specific activities and it shows lack of attention to the importance of working space for medical records personnel in the public hospitals of Isfahan. While in a study on personnel's health and administrating organizations paying attention to the work environment and its health are considered among important goals of international organizations.[27] The results of studies on human resources show that developing efficient human resources has direct and significant role in achieving many

organizational goals. Reducing costs, achieving economic progress, more competence, selling, providing effective services for customers are all positive goals and outcomes of creating suitable and healthy space and environment at work.[28]

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the process area of performance management in the managed level of is 40. The process area of performance management includes 12 practices and activities with a maximum mean of 60. The mean score of 40 (66.66%) out of 60 (100%) maximum score is an average score. Hospital number 10 with score 60 had the perfect score and hospital number 4 with score 26 had the lowest mean score in this level.

The purpose of performance management is to establish objectives related to committed work against which unit and individual performance can be measured, to discuss performance against these objectives, and to continuously enhance performance. The primary focus of performance management is on the continual discussion about the performance of work to identify ways to improve it. Discussions of performance focus not only on the individual, but also on work processes, resources, and any other issues that can be addressed to improve performance.[24]

Almost every organization has a performance management system that is expected to achieve significant goals in managing human resources. There are various factors that can affect the effectiveness of a performance management system. These factors are studies in many experimental researches. For example, significant researches show that if the feedback is provided continuously, evaluations are conducted based on behavior and trained inspectors are employed, the effectiveness of performance management will improve.[15]

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the training and development process area of the managed level is 28. The process area of training and development process area includes 9 practices and activities with a maximum mean of 45. The mean score of 28 (62.22%) out of 45 (100%) maximum score is an average score. Hospital number 10 with score 45 had the perfect score and hospital number 7 with score 11 had the lowest mean score in this level. Dayer in his book "New Theories in Management and Development of Organization" says that education has close relationship with career development.[19] Each unit should prepare an educational program to assure that all personnel have the necessary skills to do their duties. The results of this study show that a few personnel said that the hospital's medical records department has a plan to reach its educational needs and follows its plan. Considering the importance of the subject there should be actions and measures to improve the current situation. For example, the experiences of other organizations in the field can be used.

A study assessed the knowledge level of 30 medical records personnel in three hospitals of social welfare in Isfahan before and after educational courses using a questionnaire. The results showed that the in-service course had a significant effect on increasing personnel's knowledge. While the study mentioned that the condition of in-service courses for personnel of medical records in hospitals affiliated with Medical universities in Iran have a low quality.[29] In a study on assessing probable risks in hospital medical record department via FMEA model, it was determined that the most important cause of problems in this department were lack of correct documentation and educational programs.[30] As it is said the origin of problems in the medical records department is education. Considering this fact and also considering the low mean score in this area compared to other areas, there should be some actions to improve this process.

The mean score of personnel's skills and abilities in medical records departments of public hospitals of Isfahan in the compensation process area of the managed level is 29. The compensation process area includes 10 practices and activities with a maximum mean of 50. The mean score of 29 (58%) out of 50 (100%) shows those personnel's skills and abilities in medical records departments of public hospitals of Isfahan are also average. Hospital number 10 with score 50 had the highest score in this area and hospital number 76 with score 14 had the lowest mean score in this level.

The purpose of compensation is to provide all individuals with remuneration and benefits based on their contribution and value to the organization. The organization must formulate a compensation strategy that motivates and rewards the skills and behaviors the organization considers vital to its success.[24]

In an article on the compensation and reward systems based on the value, the results says: It seems that the first step in applying compensation and reward systems based on value in governmental organizations and companies is to find necessary strategies to remove restrictions existed in this regard. In fact, revising supervising and executive structures of the state is of high priority. No doubt, such reforms should be associated with changing attitudes, as well as paying attention to other decision-making systems such as manager recruiting system (affiliating, appointment, retention or dismissal). To start such movement, what organization or institute should be pioneer is the issue that sooner or later would be clarified by the needs of manager's community. However, more important than that is to take right steps in the right path and away from political reactions, so that at the end the society's interests are secured.[31] Considering the importance of this area in creating motivation among personnel and improving their performance and the lack of attention to this area based on the results of the present study, it is recommended that some strategies are developed to improve the current situation.

The strength of hospitals number 1, 6, 11, 12 and 13 is in their performance management area, while it is staffing area for hospitals 3, 4, 5, 7, 8, 9, 10, 14, 15, 16 and 17 and it is

communication and coordination for hospital number 2. Hospital number 10 had the highest mean score in all areas compared to other hospitals.

The weakness of hospitals number 1, 4, 5, 7, 11, 13 and 17 is in training and development process area, while it is in compensation process area for hospitals 2, 6, 14, 16 and is work environment for hospitals 3, 8, 9, 10, 12, 14 and 15 and is staffing area for hospital 13. The lowest scores and weak points belonged to hospital 13 in staffing area, hospital 4 in communication and coordination area, hospital 7 in work environment, hospital 4 in performance management, hospital 7 in training and development process area and hospital 6 in compensation and service rewards.

CONCLUSION

In this study, PCMM was conducted for the first time in medical records departments. The importance of using PCMM and its role in developing abilities and capacities of medical records personnel is obvious in improving the quality level of medical information management and is of high value. In general, the study results show that hospital number 10 with the mean score of 55 out of 56 had the highest level of maturity in second level of PCMM and hospitals number 1 and 4 with mean scores of 24 are in the lowest level. The mean of personnel's skills and capacities in the medical records department in most hospitals is high in staffing process area and is low in training and development process area. Considering the low scores of these two areas, managers should pay more attention to these areas based on the needs and weak points and plan reforms and educational programs to improve the situation. Conducting this model without using the results for correcting the current condition has would be fruitless.

Regarding the right conduct of this model, it can be said that using this model makes personnel, authorities and managers able to evaluate, plan and continuously improve their procedures and management systems and development of their human resources, because this model is thorough and precise and includes most areas of human resources management such as staffing, communication and coordination, work environment, performance management, training and development process area and compensation and reward system.

REFERENCES

1. Guldentops E. Maturity Measurement-First the Purpose, Then the Method. Information Systems control Journal 2003; 4:1-12. Available from: http://www.isaca.org. [Last accessed on 2010 Mar 22].
2. Zaher F, Maheri M. Designing a measurement Model for Maturity of Quality Management Model in Organizations, Industrial Management Journal, IAU, Sanandaj Branch 2009;4. Available from: http://www.sid.ir/fa/VEWSSID/J_pdf/20813881006.pdf [Last accessed on 2010 Mar 22].
3. Kwak Y. and Ibbs C. Project management process maturity (PM) 2 Model. Journal of management in Engineering. 2002;18:150-5.
4. (July 2002, Vol. 18, No. 3: p. 150-155 (doi: 10.1061/(ASCE) 0742-597X (2002) 18:3 (150)). http://ascelibrary.org/doi/pdf/10.10 61/%28ASCE%290742-597X%282002%2918%3A3%28150%29
4. Hakimian H. What is People CMM? Accessible from: http://www. pmir.com/filemain/P-CMM.pdf [Last accessed on 2010 Mar 23].
5. Sangeeta D. PCMM: A new paradigm in TQM and human resources, Quality Control Management, Foundation for Organisational Research and Education ISSN: 0970-2385. Available from: http://www.freepatentsonline.com/article/Abhigyan/227355993. html. [Last accessed on 2010 Mar 27].
6. Wong KY. Critical Success Factors for Implementing Knowledge Management In Small And Medium Enterprise. Industrial Management Data Systems 2005;105:261-79. (Kuan Yew Wong, (2005) "Critical success factors for implementing knowledge management in small and medium enterprises", Industrial Management and Data Systems, Vol. 105 No: 3, p. 261-279)
7. Available from: http://www.bpoindia.org/research/PCMM-model. html. [Last accessed on 2010 Mar 22].
8. Viv Speller, Jenny Byrne, Sue Dewhirst, Palo Almond, Lisa Mohebati, Melanie Norman, Sarah Polack, Anjum Memon, Marcus Grace, Barrie Margetts, Paul Roderick, (2010) "Developing trainee school teachers' expertise as health promoters", Health Education, Vol. 110 Iss: 6, pp. 490-507. Available from: http://www.emeraldinsight.com/ journals.htm?articleid=1889696 and show=abstract [Last accessed on 2010 Jun 08].
9. Toccoli S, Muzio G. The Concept of Practice in the People CapabilityMaturity Model Proceedings > Proceedings of ALPIS. Sprouts: Working Papers onInformation Systems. Available from: http://sprouts.aisnet.org/10-23. [Last accessed on 2010 Mar 27].
10. Toloie-Eshlaghy A, Peydaie M. Designing the Model of Human Resource Excellence in Iranian Public Sectors, European Journal of Economics, Finance and Administrative Sciences, ISSN 1450-2275 Issue 35, © EuroJournals. Available from: http://www. eurojournals.com. [Last accessed on 2011 Dec 17].
11. Luthy D, Fortch K. Laws and regulations affecting information management and frameworks for assessing compliance, Information Management and Computer Security. Vol. 14. Emerald Group Publishing Limited; 2006. p. 155-66.
12. De Bruin T, Ronald F, Uday K, Michael R. Understanding the Main Phases of Developing a Maturity Assessment Model. In: Campbell B, Underwood J, Bunker D, editros. Australasian Conference on Information Systems (ACIS). Australia, New South Wales, Sydney: 2005. http://eprints.qut.edu.au/25152/. [Last accessed 2010 Mar 17].
13. Curtis B, Hefley W E, Miller S. Experiences Applying the People Capability Maturity Model. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University; 2003.
14. Rony D, Evans S. KM Your Way to CMMI. Journal of Knowledge Management, 2006;10:69-80. Rony Dayan, Stephen Evans, (2006) "KM your way to CMMI", Journal of Knowledge Management, Vol. 10 No: 1, p. 69-80.
15. Robinson HS, Anumba CJ, Carrillo PM, Al-Ghassani AM. A Knowledge Management Maturity Roadmap for Corporate Sustainability. Business Process Management Journal 2006;12:793-808. H.S. Robinson, C.J. Anumba, P.M. Carrillo, A.M. Al-Ghassani, (2006) "STEPS: A knowledge management maturity roadmap for corporate sustainability", Business Process Management Journal, Vol. 12 No: 6, p. 793-808.
16. Mosadeghrad A. Lesson plan for the hospital organization and professional management. Tehran: Culture and Art Institute of Dibagaran; 2004.
17. Rao L, Osei-Bryson KM. Towards Defining Dimensions of Knowledge Systems Quality. Expert Systems with Applications 2007;33368-78.
18. Kazemi F Tabatabai Z. "Comparing the job condition of medical record workforces in medical records departments of public hospitals of Tabriz". Proceedings of second seminar of the medical records students in Iran, 23-4 December, Committee of student researches, Shiraz University of Medical Sciences, Faculty of medical management and informatics; 2006.
19. Naseri T. Management model for potential dangers in medical

records department of Al-Zahra hospital. Isfahan, 2006-7. MS thesis for Medical Records Education. Faculty of medical management and informatics, Isfahan University of Medical Sciences; 2007.

20. Yarmohammadian MH, Tofighi S, Saghaiannejad Esfahani S, Naseribooriabadi T. Risks Involved in Medical Records Processes of Al-Zahra Hospital. Health Information Management, Available from:<http://www.him.mui.ac.ir/index.php/him/article/view/66>. [Last accessed on 2011 Oct 28].

21. Yarmohammadian, MH. Needs assessment in public health organizations. Isfahan: HonarhayeZiba; 2004.

22. Yarmohammadian, MH, Bahrami S, Foroughi Abari AA. Health managers and experts and appropriate models of need assessment. Iranian Journal of Medical Education: Isfahan; Vol 9. 2003.

23. Yarmohammadian MH, Agharahimi Z, Haiati Abbarik H, Mohammadi Bakhsh R. Case Study Methodology and Its Application in Field of Research in Health Management and Planning. Health Information Management, Isfahan. Available from: http://www.him.mui.ac.ir/index.php/him/article/view/205. [Last accessed 2011 Oct 28].

24. Available form: http://www.sei.cmu.edu/publications/documents/01.reports/01mm001.html. [Last accessed 2010 Mar 22].

25. Salimi M, Moti`i T, Kaveh M. Comparative study of methods for selection and recruitment of personnel in different countries. Proceeding of conference on human resource development (3-4 December 2006). The institute for studies on efficiency and human resources. Tehran: Ahar; 2006.

26. Sadoughi F, Ebadifard Azar F, Ahmadi M, Piri Z The Process-Oriented Model of Organizational Memory: A Prerequisite for Knowledge Management in Medical Records Departments. Health Information Management 2012; 8 (6): 753. http://him.mui.ac.ir/index.php/him/article/viewFile/583/625#page=13.

27. Eslamdust F. Personnel's health and administrating organizations. Accessible from: http://www.yazdwater.ir/SC.php?typecomponent_sections and id61andt2=DTandsid=1. [Last accessed 2010 Mar 22].

28. Shikdar A A, Sawaqed N M. Worker productivity, and occupational health and safety issues in selected industries, Computers and Industrial Engineering Vol 45, No 4, December 2003, Pages 563–572. Available from: http://www.sciencedirect.com/science/article/pii/S0360835203000743 http://dx.doi.org/10.1016/S0360-8352 (03) 00074-3.

29. Curtis B, Hefley B, Miller S. People Capability Maturity Model (P-CMM) Version 2.0, Second Edition., TECHNICAL REPORT, CMU/SEI-2009-TR-003, ESC-TR-2009-003, Software Engineering Process Management, July 2009, Available form: http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2 and doc=GetTRDoc.pdf and AD=ADA512354.

30. Yarmohammadian M H. Tofighi S, Saghaeian S, Naaseri T. Assessing probable risks in hospital medical record department via FMEA model. France: Practices Research Applied to Health Services (ORAHS); 2007. p. 15-20. [Last access 2010 Mar 27].

31. Qorbani, Saeed. Value-based compensation systems. Available from: http://www.imi.ir/tadbir/tadbir-153/article-153/7.asp. [Last accessed 2010 Mar 22].