INVESTIGATING THE OBSTACLES OF IMPLEMENTING HEALTH INFORMATION SYSTEMS FROM VIEWPOINT OF PERSONNEL OF MEHRIZ HEALTHCARE SYSTEM IN 2017

Abbas Yazdanpanah1, Hamid Eatemadololama1, Somayeh Hessam2

1Department of Healthcare Management, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran
2Department of Health Services Administration, South Tehran branch, Islamic Azad University, Tehran, Iran

ABSTRACT

Objectives: Health centers have a special significance as one of main organizations of providing services and first line of access to services for people. These centers severely require using various means of information systems due to existence of high volume and variety of information in various fields and the best tool for managing this collection of wide and different information is Sib health information systems. The present study was conducted with the aim of investigating obstacles of implementing Sib health information system from viewpoint of personnel of Mehriz healthcare network in 2017.

Methods: This study investigated the obstacles of health information system qualitatively and with content analysis method. The research environment includes Mehriz city healthcare network and the study sample was 12 managers and authorities of Mehriz health center as key authorities who entered interview with purposeful sampling method with personal consent. Data collecting tool in this study was open questions. After performing interviews and implementing them, the data obtained from interview was analyzed based on topics and subtopics.

Results: The results obtained from interviews analysis showed that totally there are 5 main topics from view of Mehriz health network personnel for implementing Sib system. These topics include obstacles relating to human forces about commissioning an information system from viewpoint of personnel of Mehriz healthcare network in 2017, requiring healthcare may be the criterion in planning in this field and helps determining objectives and hypotheses or not. Statistics and indicators are criteria able to measure success of an organization and we require preparing and applying suitable indicators for effective supervision. Having information about requiring healthcare may be the criterion in planning in this field and helps determining objectives and providing services. What was mentioned indicates that in the health domain rate and accuracy of indicators measurement is inevitably significant for assessing performance. Growth, development and increasing of the environment increasing complexities has caused managers of healthcare organizations to seek more and
more accurate information for reaching effectiveness and efficiency of their organizations performance and revival in the market. For improving functional indicators, managers require a system like health information system, which provides the actual rate of available indicators accurately, and in the shortest possible time for them. World Health Organization considers the aim of creating health information system as developing mechanized service of patients' information, which will lead to effective promotion of information for caring patients, statistics, training and research. Health information system through providing accurate information for policy makers causes improvement of decision making in healthcare systems and many managers believe that they have to use them in health section for creating evolution. Regarding that health section severely depends on information, so managers of these organizations should understand that it is only through powerful domains of information management that they could enter capabilities of health information system and information management in their business approaches, since systematic evaluation of health information system supports clinical, financial and managerial measurements of treatment cares and leads to modifying and developing health software proportionate to users' needs. One of information systems which have been implemented at present is health information system or Sib. According to circular No. 298/100 dated 25.06.2016 of Minister of health, Treatment and Medical Training, Sib system was set in Universities of Medical Sciences and from beginning of October 2016 any type of registration, collecting and reporting information in paper is forbidden in the country level and will merely performed through Sib system. It should be mentioned that now some of universities of medical sciences have completed the operation of omitting paper and making the whole processes electronic. This system follows objectives like creating health electronic files for all people, creating national base of health domain information, providing health services for all Iranians all over the country especially less developed regions and cities margins for increasing social justice level and securing public health, promoting qualitative level of health services through standardization of services according to the latest national health plans and providing health services based on private needs of age groups especially in risk groups (mothers, children and elders). Yet, the present study has been newly triggered and has some obstacles, which require studies in this field. So the present study was conducted with the aim of investigating obstacles of implementing Sib health information system from view of Mehriz healthcare network personnel. 

METHODS

This study was performed qualitatively and with content analysis method for investigating health information system. The study setting included Mehriz City health network. In this study, the considered population for investigating obstacles and performing interviews was managers and skilled experts in the field of health information system. Also, some skilled people from the Vice-Chancellor for health of Yazd Shahid Sadoughi University of Medical Sciences entered the study. The study sample was purposefully selected from heterogeneous groups of managers and authorities of Mehriz healthcare network. 12 managers and directors entered the interview as key informants through purposeful sampling method with personal consent. The history of service higher than 5 years old, the key role of person in the considered unit, interest and high motivation for participating in the interview were considered as primary criteria of participating in the interview. Data collecting tool in this study was open questions. This form besides the interviewee primary specifications included the place of performing the study, date and hour of interview, non-verbal reactions and emotional states relating to interview and other necessary information. For validity of the study, some principles such as validity or credibility, transferability or transmissibility and conformability were considered. For investigating reliability in the study, the principle of dependability was also considered which is referred to data retrieval and repeatability of data by other researchers. After completion of interviews, their text was written and typed word by word. In the process of analysis which started at the time of interviews, at first the pre-existing theories were put aside and then the text was read several times so that a complete understanding of it is obtained and in the next stage, the semantic units were specified and primary codes were extracted. Primary codes were placed in one class based on similarities and differences existing between them and then subcategories were created. For extracting codes, no special software was used.

RESULTS

The results obtained from interviews analysis showed that from view of Mehriz healthcare network; totally, there are five main topics or five general obstacles for implementing Sib system. These topics include obstacles relating to human resources for triggering or implementing health information system, financial obstacles for Sib health information system, legal and ethical obstacles for Sib health information system, technical obstacles (software and hardware) for Sib health information system (Table 1 to Table 4).

Topic 1: Obstacles relating to human force:

In the topic 1, 5 subtopics of insufficient experience of human force and weakness of knowledge transfer in health domain, lack of specified rules and regulations for attraction, training or retraining of personnel, insufficient knowledge, expertise and skill of personnel, low commitment and understanding of personnel and lack of support and attention to creative ideas which have a limiting role on Sib system implementing.

Topic 1-1: insufficient experience of human force and weakness of knowledge in health domain

Personnel don't have enough experience about health information systems and among governmental and private organs any such transfer of experiences and cooperation is performed.
Table 1: Four topics and subtopics obtained from interviews analysis

| Main categories | Main components | Item |
|-----------------|-----------------|------|
| Insufficient experience of human resources and weakness of transferring knowledge in the health domain | Obstacles relating to human resources | 1 |
| Lack rules and regulation specified for attracting, training or retraining of personnel | Financial obstacles | 2 |
| Insufficient knowledge, expertise and skill of personnel | Legal obstacles | 3 |
| Low understanding and commitment of personnel | Organizational obstacles | 4 |
| Lack of support and attention to creative ideas | Technical obstacles | 5 |
| Insufficient validity for repair and maintenance | | |
| Insufficient validity for equipping and updating | | |
| Lack of rules for confidentially of information | | |
| Lack of responding | | |
| Spiritual ownership | | |
| Planning and organization | | |
| Commitment | | |
| Culture | | |
| Coordination | | |
| Equipment non-updating | | |
| Support | | |
| Access | | |

The trend of transfer of experiences is not performed between governmental and private organizations with optimal order and principles. Topic 1: lack of specified rules and regulations for attracting, training or retraining of personnel: Rules and regulations of training and updating human resources information have not been codified and about attracting of specialized forces of medical information technology of medical information no special rule has been codified. Topic 1-3: insufficient knowledge, expertise and skill of personnel There are not human resources with sufficient skill and expertise in the field of working with information technology and personnel has no skill in the field of working with equipment, software and hardware. Topic 4-1; low commitment and understanding of personnel regarding cares and activities becoming electronic, there is no suitable understanding of health technology, especially in veteran personnel and apprentices Topic 5-1: lack of support and attention to creative ideas In respect to supporting posed ideas and views, which are presented by users, sufficient support is not performed. Topic 2-3: insufficient credit for equipping and updating Designating budget for establishing and updating programs has not been well performed so that system is not updated in suitable time. Topic 3: legal obstacles Topic 3-1: lack of rules for information confidentiality Lack of supplying private environment especially about caregivers of women health and also in many medical centers, the nutrition and mental expert has no special room or working table and rooms are in common. Rules codified for preserving confidentiality are little, for example, the entering code to system is accessible by everybody. Topic 3-2: lack of responding In many cases, the system faces problem that it is required that the origin company of the system provide information for the user that the information does not show the identity of people but there is no specific respond in this regard. Topic 3-3: spiritual ownership Companies providing software merely see themselves as owner of the system and though the system purchased by the university, but they oppress the system spiritual ownership right that belongs to health network. Topic 4: organizational obstacles There is no positive attitude on behalf of personnel in using information technology for facilitating and accelerating tasks. There is no planning and organizing by high rank authorities that this causes disorder in providing services and using system. Topic 4-2: commitment It is required that users of the system to have organizational and working liability that in such cases there is no commitment. Topic 4-3: culture
Still there is no suitable culture about using and maintaining information system in optimal level. Topic 4-4: coordination
No suitable coordination between sectors is performed for facilitating the affairs and registering the information system and applying discord between various sections19.

**Topic 5: technical obstacles**
Topic 5-1: non-up-to-date equipment
The available software is an incomplete copy of west specimen that this same incomplete translation is contradictory and imagery.
Topic 5-2: support
Supporting companies in technical respect either in the province health network or the plan main support don’t support the plan problems
Topic 5-3: access
There is only access to internet or internal network that sometimes due to non-payment of dues by the supporter; we face disconnection of network and lack of access to the system18.

**DISCUSSION AND CONCLUSION**
In the present study, we investigated the effective obstacles in better implementing of health information system in the form of 5 groups of human, financial, legal, organizational and technical obstacles. In human obstacles, topics such as personnel experience and supplying personnel training needs were identified. The results of studies performed by Yuen and Ma indicate that personnel experience and attitude towards implementing information technology is among obstacles of this system. Many studies have been performed about human and individual resources effective on accepting information systems and individual obstacles have been investigated from various dimensions. In the study performed by Robertson, one of individual dimensions of utilizing information systems is related to individuals’ general knowledge. If the general literacy level and the ability of using day technology in a country is suitable, it will be an effective factor in mobility of the whole society towards using technology progresses. General knowledge in third world countries is in a low level due to low level of society culture, rural life, low level of literacy, failures and economic, political and social poverty, so it is considered as a very great obstacle for developing modern communicational networks in that society. Generally, it could be said that the human force factor is considered as the most important factor in the field of acquiring modern technologies and its development. Countries who want to progress in this field, should invest for increasing of general knowledge, training efficient and specialized forces, increasing of professional knowledge of agents of information systems activities and also increasing of general and professional knowledge of respective organizations personnel in the trend of modern communicational and informational technologies and providers of new services9. In technical obstacles, topics such as inefficacy of available equipment, lack of software and hardware support and inappropriate access to internet and intranet are considered among important obstacles. Access to internet and intranet requires formation of internet service providers. Providers of internet services should connect to mother big stations and by having phone lines with sufficient number, provide this possibility for those who want to use internet. It is suggested that for modifying and improving infrastructures of information systems, some measurements are performed for increasing the internet speed, preparing and producing more up to date software and hardware and preparing support systems. Health centers could use potency and experience of private and international companies in preparing and supplying required in creating smart information network by attracting their support11.

Among organizational obstacles, topics such as managers’ support from information technology unit and personnel commitment were identified. The obtained results are consistent with the results obtained from studies of Toprakci et al.11 Drent et al.12 and Melsen et al., who considered managerial factors effective in utilizing technology. These scholars found out that non-cooperation of management personnel and lack of support and commitment of managers and change of rules prevents from utilizing technology. Lack of continuous support of senior manager is one of cases, which has commonly been emphasized by Kwok et al.,13 Langli et al. and Bellone et al.14 In addition, in Siponen and Willison et al., view, if there is not sufficient knowledge and awareness about information system, the organization will face some problems at the time of implementing this standard, so it is proposed that specialized and experienced managers who have sufficient specialty in the field of managing resources and using equipment are used9. In legal resources, topics such as non-observance of information confidentiality and lack of administrative policies were considered. Gupta et al., in their study considered security and preserving privacy effective in utilizing information technology by small and medium companies16. Regarding that today, the subject of management of information security faces many controversial problems due to high complexity, these debates are in the line of providing framework, method and technologies for improving information security implementation in the organization. Effective implementation of information security requires an integrated approach. In the present status, information security has found a managerial nature and has required training and attention of organizations managers. This has caused codification of one of the most comprehensive standards of information security management in 2005 called ISO 200:20071. The aim of codifying this national standard is to specify a requirement for creation, implementation, exploitation, monitoring, revising, maintaining, improving and promoting a documented security management system. Therefore, it is proposed that health information systems model these standards for preserving information confidentiality and extend warranty of implementing health information system in all organizations. In financial obstacles, the most important topics from view of studied samples was supplying credit for repairing and maintaining
computer and network systems and supplying credit for software and hardware. In the study of Smith et al., the financial subject was considered among main obstacles in implementing hospital information system\(^7\). In their comprehensive evaluation model have pointed to economic concepts as one of main dimensions and introduced criteria of measurement, cost analysis, effectiveness and opportunity analysis. In another study has investigated investment status in information systems in one of treatment service centers\(^6\). Regarding the identified obstacles, appropriate ways of obviating obstacles include giving information about application and development of information system in health domain, holding conferences with the aim of providing the latest achievements and using competent people in training and providing applied educations in this field, providing high capacity of internet band for health offices and organizations, updating transmission equipment and also increasing commitment between user and supporter.

**AUTHOR’S CONTRIBUTION**
The manuscript was carried out, written, and approved in collaboration with all authors.

**CONFLICT OF INTEREST**
No conflict of interest associated with this work.

**REFERENCES**
1. Khalilnezhad R, Barati Marnani A. Measuring hospital performance. J Health Administration 2004; 7(15):56-68. [https://doi.org/10.1016/j.mcm.2010.03.006](https://doi.org/10.1016/j.mcm.2010.03.006)
2. Maly W, Strojwas AJ. Statistical simulation of the IC manufacturing process. IEEE Transactions on computer-aided design of integrated circuits and systems 1982; 1(3):120-31.[https://doi.org/10.1109/TCAD.1982.1270003](https://doi.org/10.1109/TCAD.1982.1270003)
3. Farajzadegan Z, Javadi A, Asgari GR, Manzouri L. Indicators of utilization as a means for assessment of health information management systems, 2007.PMID: 22548101
4. Buntin MB, Burke MF, Houglín MC, Blumenthal D. The benefits of health information technology: a review of the recent literature shows predominantly positive results. Health affairs 2011; 30(3):464-71. [https://doi.org/10.1377/hlthaff.2011.0178](https://doi.org/10.1377/hlthaff.2011.0178)
5. Moghaddasi H, Hosseini A, Sheikhtaheri A. A new model for the organizational structure of medical record departments in hospitals in Iran, Perspectives in Health Information Management/AHIMA, American Health Information Association 2006: 3.
6. Weaver CA, Ball MJ, Kim GR, Kiel JM. Healthcare information management systems. Cham: Springer International Publishing, 2016.
7. Derakhshani J, Vahedi M. Evaluating the Effectiveness of Hospital Information System [HIS] (Case study: Tabriz Teaching Hospitals). Depiction of Health 2015; 6(2):1-7.
8. Yuen AH, Ma WW, editors. Knowledge sharing and teacher acceptance of web based learning system. C McBeath, Atkinson, D Jonas-Dwyer, and R Phillips, editors, Beyond the comfort zone: Proceedings of the 21\(^{st}\) ASCILITE Conference; 2004. [https://doi.org/10.1177/0972063418799164](https://doi.org/10.1177/0972063418799164)
9. Robertson J. Does permeation work? Promoting the use of information technology in teacher education. J Information Technology Teacher Educ 1997; 6(2):169-84.
10. Torero M, Von Braun J. Information and communication technologies for development and poverty reduction: The potential of telecommunications: Intl Food Policy Res Inst; 2006.
11. Toprakci E. Obstacles at integration of schools into information and communication technologies by taking into consideration the opinions of the teachers and principals of primary and secondary schools in Turkey. Journal of Instructional Science and Technology (e-JIST) 2006; 9(1):1-16.
12. Drent M, Meelissen M. Which factors obstruct or stimulate teacher educators to use ICT innovatively? Computers and Education 2008; 51(1):187-99. [https://doi.org/10.1016/j.compedu.2007.05.001](https://doi.org/10.1016/j.compedu.2007.05.001)
13. Kwok L-F, Longley D. Information security management and modelling. Information Management and Computer Security 1999; 7(1):30-40.
14. Bellone J, de Basquiat S, Rodriguez J. Reaching escape velocity: A practiced approach to information security management system implementation. Information Management and Computer Security 2008; 16(1):49-57. [https://doi.org/10.1007/s00189-007-0274-z](https://doi.org/10.1007/s00189-007-0274-z)
15. Siponen M, Willison R. Information security management standards: Problems and solutions. Information and Management 2009; 46(5):267-70. [https://doi.org/10.1016/j.im.2008.12.007](https://doi.org/10.1016/j.im.2008.12.007)
16. Gupta B, Dasgupta S, Gupta A. Adoption of ICT in a government organization in a developing country: An empirical study. The J Strategic Information Systems. 2008; 17(2):140-54. [https://doi.org/10.1016/j.jsis.2007.12.004](https://doi.org/10.1016/j.jsis.2007.12.004)
17. Smith HL, Bullers Jr WJ, Filand NF. Does information technology make a difference in healthcare organization performance? A multiyear study. Hospital Topics. 2000; 78(2):13-22. [https://doi.org/10.1080/00185866009596548](https://doi.org/10.1080/00185866009596548)
18. Kazanjian A, Green CJ. Beyond effectiveness: the evaluation of information systems using a comprehensive health technology assessment framework. Computers in biology and medicine 2002; 32(3):165-77. [https://doi.org/10.1016/S0010-4825(02)00013-6](https://doi.org/10.1016/S0010-4825(02)00013-6)
19. Garrido T, Raymond B, Jamieson L, Liang L, Wiesenthal A. Making the business case for hospital information systems—a Kaiser Permanente investment decision. J health care finance 2004; 31(2):16-25. PMID: 15839526