

## **Investigating the Effect of Information Literacy Skills of Residents of Kerman University of Medical Sciences on Their Awareness and Attitudes Toward Medical Error**

**Mohammad Azami, Moazemeh Soltani\***

Received: 19 February 2018 / Received in revised form: 24 Jun 2018, Accepted: 28 June 2018, Published online: 05 September 2018  
© Biochemical Technology Society 2014-2018  
© Sevas Educational Society 2008

### **Abstract**

**Introduction:** Medical error is one of the most important problems in the health care area. As a result, identifying and reducing medical error is one of the main priorities of healthcares. Nowadays, regarding the advent of new information and communication technologies, the importance of information literacy in accessing updated information and the necessity of having residents as the first person in clinical decision makings emerges. The purpose of present study is to investigate the effect of information literacy on the awareness and attitude of residents towards medical error.**Method:** The present research is a cross-sectional survey study. The sample under investigation is 150 residents of Kerman University of Medical Sciences, selected through simple random sampling method. The data collection tool was information literacy and medical error questionnaires designed based on the Likert's spectrum measurement scale. The questionnaires were distributed in two ways in person and electronics via telegram and email. The obtained data was analyzed by using descriptive statistics including mean, standard deviation and inferential statistics including Pearson correlation coefficient tests, linear regression and independent t-test.**Findings:** Out of 180 distributed questionnaires, 150 cases were completed and returned; 41.3% of the research sample members were men and the rest were women. The mean scores of information literacy skills among the residents of research population were equal to 3.18 and the mean scores of their awareness and attitude toward medical error was calculated equal to 3.09. The obtained results show that there is a positive and significant relationship between information literacy and awareness about medical error ( $P < 0.001$ ), and there is also a positive and significant relationship between information literacy and the attitude of residents towards the error ( $P < 0.001$ ).**Discussion and Conclusion:** The findings showed that there is a positive and significant relationship between the ability of residents to use and apply information literacy skills and their awareness and attitude towards medical error. In general, it can be concluded that improving the ability level of residents to apply information literacy skills improves the performance of residents in clinical decision-making and ultimately leads to community health promotion in the future.

**Keywords:** Information Literacy, Medical Error, Awareness and Attitude, residents.

### **Introduction**

It is impossible to eliminate error and mistake from human life, but it is possible to minimize this mistake by making proper decisions and choosing the effective ways. This is also true regarding the medical community and its failure, as they may also make a mistake (Bates et al., 2001). The incidence of medical error has become an obvious affair in the treatment of patients. Statistics indicate that one to three percent of the mortality rate is due to the medical error (Johnson, 2016). Also, the costs due to the medical error have been estimated to be between seventeen and twenty-nine billion dollars in a year (Stetina et al., 2005). On the other hand, increasing the ever-increasing amount of published information, lack of access to up-to-date and valid information, and lack of time and overwork have caused the physicians to face with problem in making timely decisions (Firouz & Khatami, 2004).

Nowadays, acquiring and learning information literacy skills has become very important in enabling physicians to access useful and beneficial information, in a way that it, as a course unit, has become a requirement for general medical students, especially students of the last three years (Ebrahimi et al., 2015). Information as the basic factor of informative communities is a phenomenon that influences our decision making regarding a variety of issues, such as healthcare issues. Currently, health information is available to individuals in electronic and web-based formats massively. The important point in this regard is to avoid using and accessing invalid and inaccurate information existing in the web environment, which requires the acquisition of information literacy skills (Dastani & Sattari, 2016). Information literacy has been defined as the ability to identify the required information, locating resources, effective use of information

---

**Mohammad Azami**

PhD, Assistant professor, Medical Informatics Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran.

**Moazemeh Soltani\***

MSc, Dept. of Medical Library and Information Sciences, Kerman University of Medical Sciences.

\*Email: moazemesoltani@yahoo.com;

in problem solving and decision making and planning in conducting the affairs (Hassanzadeh, 2009). Among the components of information literacy, the understanding of information need, finding information, information evaluation, organizing information and the exchange and dissemination of information can be named (Sharif Moghadam et al., 2016). Also, the studies performed on the status of medical students' information literacy indicate that the mean scores of students in all information literacy standards are significantly lower than the ideal limit; this point makes paying attention to the training of information literacy skills and the relationship between students and faculty member necessary (Hashemian et al., 2014).

Residents are the first contact point of patients with health care provider centers and play a key and important role in daily activities and clinical decision makings. Also, medical error is considered as one of the main challenges in the field of healthcare. Therefore, it has been tried in the present research to investigate and analyze the impact of information literacy skills on the awareness and attitude of residents towards medical error. The results obtained from this research are expected to contribute significantly to the independent and lifelong learning of physicians and to provide more useful services for the patients. It also provides the context for promoting the level of awareness and the performance of physicians in improving community health.

## Method

The present research is a cross-sectional survey with a descriptive analytical approach. The population under survey is 369 residents of Kerman University of Medical Sciences. The considered sample size for this study based on the sample size determination formula by using the correlation coefficient of  $r = 0.266$  was calculated equal to 144 people. To increase the accuracy of study, 150 people were entered to the study. A researcher-made two-part questionnaire was used to collect data. The first part of questionnaire related to the demographic information included gender, work experience, professional field, and work place, and the second part of questionnaire was related to the medical error, which the awareness and attitude of residents about the medical error was assessed in two parts. The mean scores in the questions related to each variable were calculated as the value of that variable. The validity of questionnaire was confirmed by five faculty members of the Department of Medical Library and Information Science and their opinions were regarded in the questionnaire. For measuring the reliability, the questionnaire was provided to 25 sample subjects. The obtained Cronbach's alpha amount is equal to 0.94, indicating that the questionnaire has appropriate reliability coefficients. The questionnaire was distributed by the researcher in person. The link of questionnaire was also provided online via e-mail and telegram groups to residents. In order to ensure the participants and respect confidentiality in the research, the questionnaire was distributed unnamed. On face-to-face visit, necessary explanations regarding the purpose of study were provided by the researchers to the participants. The obtained data was analyzed by using descriptive statistics including mean, standard deviation and inferential statistics including Pearson correlation coefficient tests, linear regression and independent t-test.

## Findings

The responding amount to the questionnaire was 150 people, 41.3% of the participants in the research were men and 58.7% were women. Based on the obtained findings, there is a significant relationship between the mean scores of information literacy of women and men, in men it has been obtained equal to 3.31 and in women it has been obtained equal to 3.08, the mean scores of residents' awareness and attitude toward medical error in men has been estimated equal to 3.19 and in women it has been estimated 3.01; 59.3% of the research population stated that they have been trained about medical error that the mean of their information literacy has been estimated 3.26% and the level of their awareness and attitude towards error was estimated equal to 3.09. The rate of information literacy in the radiology group was higher than other groups and it was equal to 3.67 and the awareness and attitude of residents towards the error in the neurosurgery group was higher than other groups and it has been estimated equal to 3.43.

As table 1 shows the highest compatibility of residents in the information literacy category is related to the skills of understanding information needs and organizing information and the lowest level is related to the skill of information exchange and dissemination. In general, the level of residents' attitude towards the medical error is more than their awareness rate.

**Table 1:** The Mean and Standard Deviation of the Components of Information Literacy and the Level of Awareness and Attitude towards Medical Error

Variable	Mean and Standard Deviation among Women	Mean and Standard Deviation among Men	P-Value
Understanding Information Need	3.13±0.62	3.36±0.72	0.34
Finding Information	3.10±0.58	3.25±0.58	0.12
Information Evaluation	3.04±0.58	3.36±0.70	0.002
Organizing Information	3.13±0.52	3.34±0.72	0.036
Information Exchange and Dissemination	3.01±0.66	3.23±0.71	0.055

Awareness of Medical Error	2.94±0.42	3.14±0.54	0.012
Attitude towards Medical Error	3.08±0.42	3.24±0.40	0.018
Information Literacy	3.08±0.44	3.31±0.58	0.007
Awareness and Attitude towards Medical Error	3.01±0.38	3.19±0.38	0.004

The results of Pearson correlation coefficient and regression analysis indicated that there is a positive and significant relationship between information literacy and the level of residents' awareness about medical error, ( $P = 0.001$ ); for per unit increase in the information literacy scores it is added as much as 0.356 to the mean scores of medical error. There is also a significant relationship between the scores of information literacy skills and attitude toward medical error, ( $P = 0.001$ ); and for per unit increase in information literacy level, the attitude of residents towards the medical error is increased as much as 0.250.

The findings showed that there is a significant relationship between information literacy and demographic characteristics of the research population including: gender, specialty and education. Also, there is a significant relationship between demographic information of gender and age with their awareness and attitude toward medical error. According to table 2, the obtained results of multiple regression analysis, there is also a relationship at significant level of (0.30) between information literacy skills, demographic characteristics and residents' specialty. As we go from the specialty of emergency medicine towards other groups, the level of residents' ability to information literacy skills increases by as much as 0.017. It also decreases in the variables of gender, year of specialty and education compared with the reference variable, but there is an increasing trend in the variable of study period.

**Table 2:** Information Literacy Prediction Based on Demographic Variables by Using Simple Linear Regression Model among Residents

Variable	Regression Coefficient	P-Value
Gender	-0.203	0.025
Work Experience	0.88	0.229
Specialty Type	0.49	0.832
Age	-0.005	0.939
Specialty Group	0.011	0.216
Specialty Year	-0.108	0.016
Educational Status	0.205	0.016

## Discussion and Conclusion

The information literacy of residents in Kerman University of Medical Sciences has been estimated higher than moderate limit. The findings of present research are consistent with the study of Hashemian et al. In this research, the observance of information literacy standards has been evaluated more than moderate limit and less than ideal limit, and it knows necessary to strengthen the information literacy skill of students (Hashemian et al., 2014). Also, this section of the findings of this study is consistent with the study findings of Kemalipour et al., Azami M, Sharifi H and Delkhosh et al. and Azami M, Sharifi H and Zarei E. In these studies that the level of information literacy in paramedical, nursery and midwifery students has been investigated, the findings showed that the level of information literacy of students was estimated at moderate limit, and strengthening the information literacy skill of students required more effort and training in this regard. Also, the obtained results of this study showed that the highest level of residents' ability in the components of information literacy is related to the components of "understanding information need" and "organizing information" with the mean of 3.22 and the lowest level is in the component of "information exchange and dissemination" (KamaliPour et al., 2017; Azami & Delkhosh, 2019; Azami & Zarei, 2019). In this regard, the research of Sharif Moghadam et al. confirmed the findings of present research. In this research, it was specified that the mean of the information literacy of participants in all skills related to information literacy, except the "information exchange and dissemination" standard has been more than moderate limit (Sharif Moghadam et al., 2016).

In general, the mean scores of the awareness and attitude of residents towards the medical error among the residents in the present research has been reported equal to 3.09, which is more than moderate limit, which contradicts the research findings of Nabiloo et al.; the findings of this research indicate that more than 40% of physicians evaluated their awareness and attitude toward error as insignificant and 25% evaluated it well (Li et al., 2012). Also, the results of study by Flynn et al. are not consistent with the findings of present research. The findings obtained from present research, which investigated the awareness and attitude of medical students, indicate that the level of their awareness and attitude toward medical error is at low level and has been estimated equal to 2.3 (Nabiloo et al., 2013).

Based on the obtained results, the level of awareness of residents about the medical error is equal to 3.03 and their attitude towards the error is equal to 3.14, which is more than moderate limit. Although the findings of present research are consistent with a part of the study

results of Lee Lin et al., who considered the students' attitude towards the medical error positive, it is not consistent with other part of the findings of this study, which reported their awareness towards medical error is weak (Flin et al., 2009). In this research, there is a significant relationship between information literacy and the level of awareness about the medical error with the coefficient correlation of 0.377 at a significant level of 0.001. Also, with regard to the regression coefficient of 0.356 at a significant level of 0.001, the level of medical error awareness can be predicted based on the information literacy variable. By using the obtained results, there is a significant relationship between the mean scores of information literacy and the mean scores of attitude. With regard to the regression coefficient, the effect of information literacy on the attitude of residents towards the medical error can be predicted.

According to studies and the obtained findings of the present research, it can be concluded that improving the ability level of residents to apply information literacy skills improves the performance of residents in clinical decision-makings and ultimately leads to community health promotion in the future (Azami et al., 2017; Aazami et al., 2016). Thus, it is suggested that the university should provide the context for improving the capabilities of clinical residents through holding educational seminars and workshops related to the information literacy. Furthermore, the higher the level of information literacy of residents; the increased awareness and attitude towards medical errors, also increasing the use of information literacy increases the level of awareness and attitude of residents towards medical errors, training residents in this field can compensate the shortage of their information literacy.

## References

- Aazami, Mohammad, Khjouei, Reza and Rakhshani, Safieh (2016). Postgraduate medical students' acceptance and understanding scientific databases and electronic resources. *Electronic Physicians*, 25;8(3):2066-72.
- Azami Mohammad and Elham Zarei Venovel (2019). Nurses' health information literacy relationship with their communication skills in Hospitals affiliated with Kerman University of medical sciences" is now accepted for publication in (Volume 9, S2) of the Journal of Advanced Pharmacy Education & Research [JAPER].
- Azami Mohammad and Yaghoub Delkhosh(2019). The effect of Information Literacy Training on Self-Efficacy of Nursing Graduate Students of Kerman University of Medical Sciences. *Journal of Biochemical Technology*,
- Azami Mohammad, Saeed Amini, Moosavi AliSadat, Narjes Sadat Ahmadi (2017). Evaluation and analysis of uncertainty in the information seeking behavior of medical post-graduate students , *Journal of Research in Medical and Dental Sciences*, 5 (5): , DOI: 10.5455/jrmds.201752
- Bates DW, Cohen MM, Leape LL, Overhage JM , Shabot MM, Sheridan T. Reducing the frequency of errors in medicine using information technology. *Journal of the American Medical Informatics Association*. 2001;8(4):299-308.
- Dastani M, Sattari M. Improving the information literacy of the health literacy foundation in the health information intelligence community. 2016; 7 (2): 6.
- Ebrahimi S, Bagheri P, Jowkar A. The Familiarity of Medical Students of Shiraz University of Medical Sciences with the Evidence-based Medicine Procedures. *Journal of National Studies on Librarianship and InformationOrganization*.2015;26(4):18.
- Firouz A,R, Khatami A,R. Evidence-based Medicine: An overview of the universe. *Journal of Diseases of the Skin* 2004; 26 (2): 10
- Flin R, Patey R, Jackson J, Mearns K, Dissanayaka U. Year 1 medical undergraduates' knowledge of and attitudes to medical error. *Medical education*. 2009;43(12):1147-55.
- Hashemian MR, Al Mokhtar M J, Hasanzadeh A. Comparison of Information Literacy among Medical Students of Isfahan University of Medical Sciences with the Standard of Information Literacy Capabilities for Higher Education. *Health information management*. 2014; 10 (2): 8-1.
- Hassanzadeh M Application of Information Literacy Components in Organizational Knowledge Management. *Journal of Jihad University* .2009: 134-115
- Johnson M. Developing policies and guidelines to prevent medication errors and ADEs in nursing homes. 2016.
- KamaliPour M, Azad M, Ashkani N, Zadeh ZE. Students' Media Literacy and Information Literacy in Para-Medicine, Nursing and Midwifery Faculties of Hormozgan University of Medical Sciences.
- Li L, Duan Y, Chen P, Li J, Mao X, Barracough BH, et al. Knowledge, skills, and attitudes of medical students to patient safety: a cross-sectional pilot investigation in China. *Journal of evidence-based medicine*. 2012;5(3):124-33.
- Nabilou B, Rasouli J, Khalilzadeh H. Patient Safety Status in Medical Education: Students Perception, Knowledg and Attitude. *Research in Medical Education*. 2013;5(2):23-31
- Sharif Moghadam H, Salami M, Narimani MR, Razmkhah M. The Rate of Information Literacy of Faculty Members and PhD students of Faculty of Nursing and Midwifery based on Successful Evidence Healthcare. *Journal of Nursing Education*. 2016;5(4):60-6.
- Stetina P, Groves M, Pafford L. Managing medication errors-a qualitative study. *Medsurg Nursing*. 2005;14(3):174.