INVESTIGATING THE EFFECT OF EVIDENCE-BASED MEDICINE ON KNOWLEDGE AND ATTITUDE OF RESIDENTS AT KERMAN UNIVERSITY OF MEDICAL SCIENCES TOWARDS MEDICATION ERROR

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ABSTRACT

Introduction and purpose: Medication error is the most important problem in health care. One of the ways that can be effective in minimizing medication errors is benefitting from evidence-based medicine. Moreover, Residents in the forefront of contact with patients have a decisive role in clinical decision-making. The purpose of the present study was to examine the effect of evidence-based medicine on knowledge and attitudes of Residents towards medication error. Materials and methods: The study is cross-sectional survey. The population is 150 Residents of Kerman University of Medical Sciences, selected using simple random sampling. The data collection tools are evidence-based medicine and medication error questionnaires, designed based on Likert scale measuring standard. The questionnaires are distributed in person and electronically through telegram and e-mail. The obtained data was analyzed using descriptive statistics - mean, standard deviation - and statistical inference - Pearson correlation coefficient, linear regression and independent t-test. Results: The results showed a significant relationship between the evidence-based medicine with a mean of 2.78 and the clinical knowledge and attitudes towards medication error with means of 0.03 and 3.14, respectively. Pearson correlation in the study was p-value = 0.05. The results showed a positive and significant relationship between evidence-based medicine and knowledge and attitudes towards medication error (P<0.001). Moreover, there was a positive and significant relationship between evidence-based medicine and the attitudes of assistants towards the error (P<0.001). Conclusion: The results showed that given the relationship between the ability of assistants in evidence-based medicine and their knowledge and attitudes toward medication errors, improving and enhancing the ability of the assistants in evidence-based medicine is critical, which improves the performance of assistants in clinical decision-making, and finally promotes society health in the future.

Keywords: Evidence-based medicine, medication error, knowledge and attitude, Residents

INTRODUCTION

Physicians use different methods to solve clinical problems. Evidence-based medicine is one of the ways that can help the physicians make careful and timely decisions to help the patients. Direct use of the results of scientific studies or the exacting, efficient and proper use of the best evidence for a specific disease is called evidence-based medicine. In fact, the evidence-based medicine's mission is to collect documented information and update knowledge in a clinical context based on the search of papers that summarize the best evidence and provide the most useful and most valuable information to the physician (Zarea, 2006). Among the medical components based on evidence, one can refer to formulating questions, finding evidence, critical evaluation of evidence, using evidence, and evaluating the results (Hosseini, 2012).

Nowadays, given the large volume of medical information and the ever-increasing growth in scientific resources and the workload of physicians, learning medical skills based on evidence is essential for physicians. In this method, the physician searches the most recent and best medical studies and replaces his old information with the new information to be able to make the best decision for the patient (SHARIF et al., 2016; Mohammad et al., 2018; Azami et al., 2016). Evidence-based medicine can help minimize the likelihood of mistakes among physicians and make the right decisions according to the best evidence available. On the other hand, this has brought about the emergence of a solution to the problems of medication error in recent years (Firouz and Khatami, 2003).

Medication error is an unpleasant event with horrible consequences to patients in care and treatment process. Examining the type and causes of errors is the first step in preventing them. In health care, medication errors are an important issue for health care providers, healthcare managers and policymakers. Identification and reduction of medication errors are among the main priorities of health and treatment systems (Shamsai et al., 2012). The statistics show that at least annually 250,000 people lose their lives due to preventable medication errors (Stetina et al., 2005). Moreover, the researchers have found that mortality rate due to medication errors would be even higher. According to a report by American Medical Association, 1.5 million Americans are affected by medication errors, of which on average, at least one patient per day dies because of it. In a study quoted from the same institute, the deaths associated with medication errors were reported to be 7,000 cases (Bar-Oz et al., 2008). Although no official and precise statistics are released about the mortality due to medication errors in Iran, according to the Ministry of Health and Medical Education, the long-term annual cost of admission and additional care for individuals due to medication errors have been reported to be billions of Riyals (Bayazidi et al., 2012). In another study, the mortality rate due to medication error in Iran is estimated to be 245,000 per year (Hashjin et al., 2014).

According to the report by American Medical Association, in 1999, a large part of medication errors was due to the lack of knowledge of physicians about the best practice (Bar-Oz et al., 2008). One of the ways that can partially reduce medication errors is using the evidence-based medicine. Studies in medicine and nursing show that physicians and nurses have a problem in evidence-based practice, and their greatest difficulty is finding evidence, identifying correct sources, using optimal search methods, and critically evaluating evidence (Bazbin et al., 2014). In the studies conducted, separately, by Ahmadi Abhari and Ghahraman Fard, most physicians have a positive attitude towards evidence-based medicine. Nevertheless, they lack sufficient skills in this regard (13-14). In a study, Sadeghi et al. examined the use of evidence-based resources by the members of the faculty and assistants in the Tabriz University of Medical Sciences. The using rate of faculty members is estimated to be more than that of the assistants and two thirds of the participants were unfamiliar with the subject. One of the obstacles to use evidence-based medicine is the lack of information research skills, which is introduced as the main factor affecting the best available evidence (Sadeghi-Ghyassi et al., 2013). Additionally, in the study by Marie Ann Frizen, about one hundred and twenty-one errors were detected, of which twenty-one cases led to death. It identifies and classifies medication errors and efficiently establishes effective communication processes among health care providers in reducing medication errors (Friesen, 2008). In another study conducted on the medication error, the most common errors are diagnostic errors, and the change in the behavior and

motivation of the health personnel has been introduced as the first factor in reducing the error and the most important benefit of detecting errors has been paying more attention to the future mistakes and errors (Zarea, 2006).

Residents are patients' first contact with health care providers. It plays a key role in the use of evidence-based medical concepts in everyday activities and clinical decision-making in providing health services. Medication error is also the most important health care problem. Thus, the present study tries to determine the extent and the method using the evidence-based medicine by assistants; meanwhile, it tries to evaluate the effect of evidence-based medicine on the knowledge and attitudes of Residents towards medication error.

METHODOLOGY

The study is a survey research with descriptive-analytical approach. The population was 369 Residents of Kerman University of Medical Sciences. The sample size for this study was calculated 144, according to the sample-size determination formula. To increase the accuracy of the study, 150 subjects was participated in the study. The tool used to collect data is a three-part questionnaire. The first part was demographic information including gender, work experience; field of study, workplace, and the second part was the researcher-made questionnaire about evidence-based medicine, which is provided by reviewing previous researches according to five steps based on evidence. The third part of the researcher-made questionnaire is related to medication error, which in two sections (22 questions), evaluates the knowledge and attitudes of Residents towards medication error. The reliability of the questionnaire is confirmed by five faculty members, the Medical Librarianship, and Medical Informatics Group and their opinions were included in the questionnaire. To confirm the validity, the questionnaire was given to 25 subjects. The Cronbach's alpha obtained for the questionnaire was 0.94. The questionnaires were distributed in person by the researcher. Moreover, the link to the online questionnaire was sent via email and telegram groups to Residents. The data obtained was analyzed using descriptive statistics such as mean, standard deviation and inferential statistics, Pearson correlation coefficient, linear regression and independent t-test.

RESULTS

The results indicated that out of the participants, 62 were males and 88 were females. The average use of evidence-based medicine was 2.91 in males and 2.69 in females. In addition, the level of knowledge and attitudes towards medication error in males was 3.19 and in females 3.01, showing that the use of evidence-based medicine among male assistants is more than females, and consequently the knowledge and attitudes of males towards medication error is more than that of the females.

In the present study, the skill of the assistants in each of the evidence-based medical components has been studied, and the results are presented in Table 1.

Table 1: The mean skill of Residents in using evidence-based medication

Variable	Mean and SD among males	Mean and SD among females	P-value
Developing the questions	2.74±0.64	2.34±0.72	0.001
Finding the evidence	3.01±0.59	3.01±0.56	0.99
Critical evaluation of evidence	2.78±0.71	2.53±0.67	0.09
Using evidence	3.12±0.75	3.07±0.63	0.62
Evaluation of results	2.96±0.74	2.52±0.68	0.000
Knowledge of medication error	3.14±0.54	2.94±0.42	0.01
Attitude towards medication error	3.24±0.40	3.08±0.42	0.001
Evidence-based medicine	3.91±0.47	2.69±0.48	0.007
Knowledge and attitude towards error	3.19±0.38	3.01±0.38	0.004

The results of Pearson correlation coefficient and regression analysis indicated a positive and significant relationship between evidence-based medicine and the level of awareness of assistants about medication errors (P =0.001). With every unit of increase in evidence-based medical grades, 0.465 is added to the average medication error score. In addition, there is a significant relationship between the scores of evidence-based medical skills and attitude towards medication error (P=0.001). Indeed, for every unit of increase in evidence-based medicine, the attitude of the assistants towards medication error increases about 0.250.

According to the results of the data analysis, the attitude of the assistants towards the medication error is 3.14; also, there is a significant correlation between the ability to use evidence-based medicine of Residents with a mean of 2.78 and their attitudes towards medication error with a correlation coefficient of 0.380 at the significance level 0.001 and confidence of 0.05. In other words, the more the use of evidence-based medicine is, the more their attitude towards the medication error becomes.

Regarding the relationship between evidence-based medicine and demographic components, there is no relationship between work experience, type of expertise and age. However, there are differences between specialized groups. The highest rates are in the radiology group and the lowest in the neurology group. The number of those who stated to be trained in the field of evidence-based medicine and medication errors, were 2.82 and 3.09, respectively, higher than those who did not receive training. The mean of people trained in evidence-based medicine was 2.76 and 3.8.

Table 2: Predicting evidence-based medicine based on demographic variables using simple linear regression modeling among Residents of Kerman University of Medical Sciences

Variable	Regression coefficient	p-value
Gender	-0.145	0.96
Work history	0.22	0.75
Expertise	0.23	0.28
Age	-0.04	0.50
Specialized group	0.017	0.03
Expertise year	-0.078	0.17
Training	-0.128	0.11

Table 3 indicates that according to the results of multiple regression analysis, there is a significant relationship between knowledge and attitudes towards medication error and gender at a significant level of 0.017. The level of knowledge and awareness of medication error has reduced by 0.17 in men compared to women. In history, field of expertise, training and the period of specialization, the level of knowledge and awareness of assistants of medication errors decreases relative to the reference variable.

Table 3: Prediction of medication error based on demographic variables using simple linear regression model among the Residents of Kerman University of Medical Sciences

Variable	Regression coefficient	Sig.
Gender	-0.17	0.017
Work history	-0.06	0.25
Expertise type	-0.15	0.4
Age	0.09	0.056
Expertise group	-0.005	0.44
Expertise year	-0.03	0.34
Training	-0.02	0.69

DISCUSSION AND CONCLUSION

The results showed that the ability of the assistants is less than the average and equal to 2.78, which is in line with the results of Sadeghi et al. The results of that study showed that 21% of medical assistants are familiar with their evidence-based medicine skills (Sadeghi-Ghyassi et al., 2013). In addition, in the study by Ahmadi Abhari et al., the majority of physicians lack adequate evidence-based medicine and insist on using the traditional sources more than evidence-based sources (Bar-Oz et al., 2008).

In examining previous study on medication errors, Lee Lane et al. perceived the students' attitudes towards medication error as positive, but their knowledge of the medication error was weak (Li et al., 2012). Felin et al. indicated that medical students' knowledge and attitudes towards medication errors are low (Flin et al., 2009). In this study, the level of awareness and attitudes of the assistants towards the error was more than average and, respectively, 3.03 and 3.14 with a significant relationship with evidence-based medicine. Compared to Lee Lane and Felin, Residents of Kerman University of Medical Sciences have a higher degree of knowledge and attitudes towards medication errors. The more the use of evidence-based medicine is, the greater the level of awareness and attitudes of the assistants towards the error will be. In addition, In line with the present research, Azami and Soltani's research was shown 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 (Aazami and Soltani, 2019).

The results of the study showed the significance of the relationship between evidence-based medicine and the knowledge and attitudes of the assistants towards medication error.

Assistants' familiarity with evidence-based medicine was estimated to be less than the average; therefore, it is necessary for holding training workshops to empower assistants to use medical evidence and increase their awareness and attitudes towards the medication error. Increasing the ability of assistants in using medical evidence improves their performance in clinical decisions and paves the way for improving the society health.

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