

Evaluating the relationship between information literacy and evidence-based nursing and their impact on knowledge and attitude of nurses working in hospitals affiliated to Kerman University of Medical Sciences on medication errors

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ABSTRACT

Introduction and Purpose: Nowadays, due to the importance of information literacy in obtaining documented and credible information, the necessity of nurses to achieve high levels of information literacy to improve their performance in accessing documentary and scientific information has become more evident. **Objective:** The aim of this study was to investigate information literacy, evidence-based nursing, nurses' attitudes, nurses' knowledge, medication errors, Kerman University of Medical Sciences. **Methodology:** This study was a survey study. The study units were 164 nurses working in 4 hospitals of Kerman University of Medical Sciences. The participants were chosen by simple random sampling. The instrument used included four sections: demographic information, information literacy, evidence-based practice, and medication errors. Data were analyzed using software SPSS 22. **Results:** The results of this study showed that nurses were familiar with the terminology used in evidence-based medicine ($p < 0.0001$). Also, in this study, there was a significant increase in nurses' attitude level and their ability to implement and use evidence-based nursing was observed. **Conclusions:** The result findings of the normal distribution of samples showed that 29% were male and 71% were female. The results show that there is a significant relationship between information literacy and evidence-based nursing. The direction of the relationship is positive ($p < 0/05$). This means that increased information literacy is associated with increased evidence-based nursing and on the contrary. The intensity of the relationship is moderate and it's equal to 0.37. The findings also showed that there is a significant relationship between information literacy and evidence-based nursing with the knowledge and attitude of nurses toward medication error.

Keywords: Evidence-based nursing, information literacy, Kerman University of Medical Sciences, medication error, nurses attitude and knowledge, primary health care

Introduction

Nowadays, protection of the patient's safety is considered as a basic principle of any healthcare system, so that any harm to his or her safety leads to a loss of trust in the healthcare system.^[1,2]

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Medication errors are one of the patient safety problems with a high prevalence in several countries, and often involve a lack of collaborative communication between health professionals, including doctors, pharmacists, and nurses.^[3] In global nursing education, patient safety is becoming increasingly integrated into the curricula based on actual healthcare.^[4] Nurses play an important role in preventing medication errors and in administering safe drugs. Accordingly, before they work in real situations of care, nursing students should have adequate competencies regarding medication safety.^[5] However, research shows that nursing students are still at risk of taking medication.^[6] The first step in preventing medication errors is identifying the factors that prevent increasing medication errors. Also, preventing these errors can be a way for better management of the error and preventing future medication errors.^[7] A total of 1% of medication errors has been reported in the United Kingdom, which nurses account for 8% of these errors.^[8] Many nursing researchers have reported enhancing nurses' medicinal information as an important strategy in reducing medication errors and argued that updating nurses' information, especially on new medicinal, can be an important factor in reducing medication errors.^[9] The medication errors are the third leading cause of death in the United States so that one patient in every 4 hospitalized patients suffers from harm caused by medication errors.^[10] In Iran, in a study conducted by Ramazani *et al.* in 2014, 20% of nurses stated that they did not make a medication error within 6 months and 45% of them reported 1 and 2 medication errors.^[11]

Nurses, as the largest group of health service providers, play a key role in the continuity of primary care, promoting and maintaining health at different levels of the health care delivery system. In this regard, nurses are expected to provide the highest level of primary care based on scientific findings and acquire the needed capability and skill in making clinical decisions in providing the care by reviewing the care methods. Unfortunately, studies have shown that nurses do not use the results of nursing research in the field of primary care and they provide the care for patients based on their own interests and the information passed on to them traditionally and have difficulty in evidence-based practice. The most important problems of these nurses are finding evidence, identifying the right sources, using optimal search methods, and evaluating the evidence critically.^[12] Evidence-based care has been considered as a way of improving the standards of primary care and health services.^[13]

Evidence-based practice is widely recognized as the key to improving health and primary care quality and patient outcomes.^[14] Although the purposes of nursing research (conducting research to generate new knowledge) and evidence-based nursing practice (utilizing best evidence as the basis of nursing practice) seem quite different, an increasing number of research studies have been conducted with the goal of translating evidence effectively into practice. Clearly, evidence from research (effective innovation) must be accompanied by the effective implementation, and an enabling context to achieve

significant outcomes.^[15] This knowledge can be useful in minimizing the possible mistakes and making the right decision based on the best evidence available. Its components include question compiling, evidence finding, critical evaluation of evidence, applying the evidence, and outcome evaluation.^[16] The base of critical thinking in nursing and one of the requirements of the successful implementation of an evidence-based approach in clinical practices is enhancing information literacy among the nurses and health care providers.^[17] Using information involves the ability to identify the needed information, locating the sources, using the information in solving the problem, and doing the work.^[18] Information literacy skills include perceiving information need, information finding, and evaluation of information, information organizing, sharing, and disseminating information.^[17] Information literacy of nurses is considered as one of the crucial issues in this profession due to the increasing use of research findings and updating of information in health care. Lack of information literacy makes nurses unable to obtain credible evidence. It can be stated that information literacy is a framework for evidence-based practice. Nurses need a high level of information literacy to evaluate information retrieved from databases and combine them with evidence-based practice, so nurses and nursing students must acquire information literacy skills resulting in an effective retrieval of records from high-quality clinical research articles.^[17]

One of the main goals of the nursing profession is to provide primary care to patients. Primary care can be valuable when it comes to good quality. The nurse is responsible for patient care from admission to discharge. Due to the shortage of physicians' time and the high number of clients, the use of nurses in the provision of primary care can increase patient satisfaction. The use of the best evidence in making patient care decisions, such evidence typically comes from research conducted by nurses and other health care professionals. Although most nurses have a positive attitude toward evidence-based care, it is not used in practice and nurses rely strongly on their colleagues' experiences in solving the clinical problems. The use of research results is associated with different indicators such as nurses' attitudes. Having or developing a positive attitude and skills related to understanding and adding research to clinical practice and gaining knowledge on the information search and retrieval and critical thinking are considered as essential requirements for evidence-based practice.^[19] Although evidence-based training programs are included in education, they become unfortunately a professional responsibility merely for learning purposes and they are not used practically in a clinical setting. Also, given the importance of nurses' medication errors and finding the causes of error, planning and providing strategies to reduce them to protect patient safety and improve the quality of nursing care seems to be necessary.^[18] This study seeks to answer the question of what is the relationship between information literacy and the level of using evidence-based nursing and knowledge and attitude of nurses working in hospitals affiliated to Kerman University of Medical Sciences on the occurrence of medication errors.

Methodology

This study is a survey study with a descriptive-analytical approach. The statistical population of the study included the nurses working in different units of teaching hospitals in Kerman University of Medical Sciences, including Shafa, Afzalipour, Shahid Bahonar, and Shahid Beheshti hospitals. To determine the sample size, a sample calculation formula is used for correlation studies. Accordingly, the sample size was calculated at 109 people. The data collection tool was a questionnaire. The questionnaire consists of four sections. Its first section includes demographic information, including gender, employment history, and education level. Its second part is related to the components of information literacy, derived from the study conducted by Azami and Delkhosh and its validity has been previously assessed.^[20] Its third section is related to the components of evidence-based nursing, which has been derived from “evidence-based medicine” questionnaire used in the study conducted by Azami and Soltani and its validity has been previously assessed.^[21] Its fourth section is related to the components of medication errors, which have been developed by a researcher to assess the knowledge and attitude of nurses about medication errors on a five-point Likert scale. Descriptive statistics such as mean and standard deviation and inferential statistics such as Pearson correlation and linear regression tests were used to analyze the data through SPSS version 22 software. Research Ethics committee with the ethics code of IR.KMU.REC.1399.274 at the 2019/06/28.

Results

The results showed that the majority of the investigated nurses were females ($n = 116$) and 48 of them were males. Their age range was between 26 and 44 years. In terms of marital status, the numbers of married and single nurses were almost equal. Based on the results, the majority of them had an employment history of less than 5 years and only 7% had more than 26 years of employment history. In terms of the level of education, 88.41 of them had a bachelor's degree and 11.58 had a master's degree. Also, 78% of them had graduated from public universities. The mean score of their bachelor's degree was below 16 and 58.53 of them has previous information on evidence-based practice. Before analyzing the correlation through the scatter plot [Figure 1], the linearity of the relationship between the main variables was examined. According to the scatter plots presented, it can be stated that the type of relationships is linear and the relationship between all the main variables (information literacy, evidence-based nursing, knowledge, and attitude toward medication errors) can be considered linear. According to the scatter plots, the relationship between the main variables can be considered linear in a positive direction. Due to the linearity of the relationship between the variables (in fact, lack of a nonlinear relationship), the Pearson correlation test can be used with confidence.

The relationships between the variables were tested using the Pearson correlation test. The results show that there is a significant

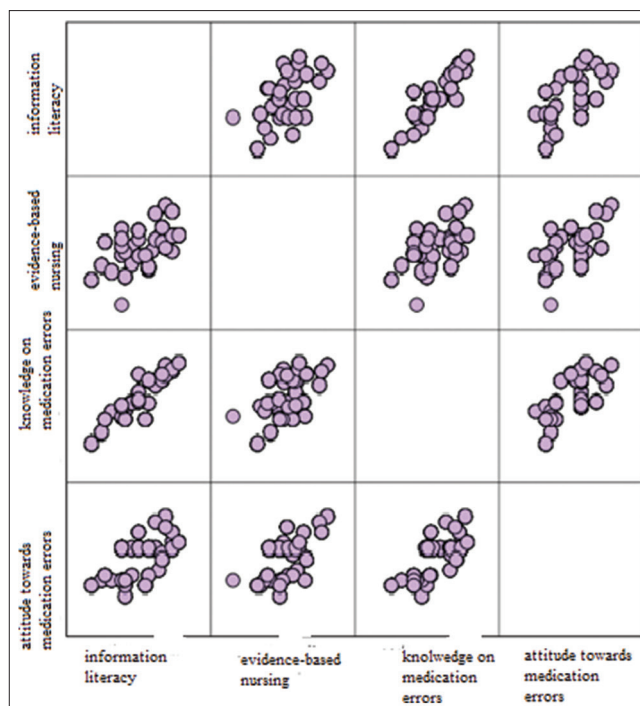


Figure 1: Scatter matrix between the research variables

relationship between information literacy and evidence-based nursing ($p < 0.05$). The direction of the relationship is positive, which means that increased information literacy is associated with increased evidence-based nursing, and vice versa. The intensity of the relationship is moderate and equals to 0.37. According to the results, information literacy is associated with all five components of evidence-based nursing ($p < 0.05$). The direction of the relationship is positive. A comparison of the intensity of the correlations shows that information literacy has the strongest relationship with formulating of question with a coefficient of 0.41 and a critical evaluation of evidence with a coefficient of 0.35. According to the results, evidence-based nursing is correlated with all five components of information literacy ($p < 0.05$). The direction of the relationship is positive. A comparison of the intensity of the correlations shows that evidence-based nursing has the strongest relationship with the perceiving need for information with a coefficient of 0.40 and an evaluation of information with a coefficient of 0.35. The results of the correlation between information literacy and evidence-based nursing are presented in Table 1.

The Pearson correlation test was used to test the relationships between the variables. The results of the correlation between information literacy and evidence-based nursing and knowledge and attitude towards medication errors are presented in Table 2. Results of the Pearson correlation test [Table 2] show that there is a relationship between information literacy and knowledge ($p < 0.05$). The direction of the relationship is positive, meaning that increasing information literacy is associated with increased knowledge and attitudes toward medication errors. The intensity of the relationship between information literacy and knowledge and attitude is 0.38 and

Table 1: Testing the correlation between information literacy and evidence-based nursing

Variables	Formulating of question	Finding evidence	Critically evaluation of evidence	Applying evidence	Evaluation of results	Evidence-based nursing
Perceiving information need	**0.33	0.45**	0.42**	0.32**	0.11	0.40**
Information finding	0.37**	0.29**	0.31**	0.06	0.29**	0.33**
Evaluation of information	0.36**	0.24***	0.52**	0.40**	0.15*	0.35**
Information organizing	0.47**	0.13	0.19**	0.20**	0.42**	0.32**
Exchange and dissemination of information	0.37**	0.20**	0.10	0.26**	0.38**	0.29**
Information literacy	0.41**	0.28**	0.35**	0.32**	0.28**	0.37**

0.05 ≥ P * 0.01, ≥ = P **

Table 2: Testing the correlation between information literacy and evidence-based nursing and knowledge and attitude toward medication errors

Variables	Knowledge		Attitude	
	Correlation coefficient	Significance level	Correlation coefficient	Significance level
Perceiving information need	0.33	<0.001	0.24	0.003
Information finding	0.37	<0.001	0.35	<0.001
Evaluation of information	0.36	<0.001	0.47	<0.001
Information organizing	0.47	<0.001	0.17	0.024
Information exchange and disseminating	0.37	<0.001	0.42	<0.001
Information literacy	0.38	<0.001	0.49	<0.001
Formulating of question	0.19	0.018	0.35	<0.001
Finding evidence	0.37	<0.001	0.48	<0.001
Critically evaluation of evidence	0.52	<0.001	0.36	<0.001
Applying evidence	0.51	<0.001	0.40	<0.001
Evaluation of results	0.48	<0.001	0.56	<0.001
Evidence-based nursing	0.51	<0.001	0.46	<0.001

0.05 ≥ P *, 0.01 ≥ = P **

0.49, respectively. All components of information literacy are associated with attitude and knowledge. Pearson correlation test showed that there is a relationship between evidence-based nursing and knowledge ($p < 0.05$). The direction of the relationship is positive, meaning that evidence-based nursing increases knowledge and attitudes toward medication errors. The intensity of the relationship between evidence-based nursing and knowledge and attitude is 0.51 and 0.46, respectively. All evidence-based nursing components are associated with attitude and knowledge.

Multiple regression test was used to investigate the effect of the independent or predictive variables (information literacy and evidence-based nursing) on the dependent variable (attitude toward medication errors). The results of the multiple regression test are presented in Table 3. A simultaneous regression method was used in this regard. The F test value was obtained 59.28, which is less than 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent variable (criterion) and can significantly predict the changes in attitudes toward medication errors.

The coefficient of determination, or R^2 , indicates the value of the variance of the dependent variable that is explained by the independent variables. The coefficient of determination was obtained 0.39, which is an average value for the regression model of this study. The obtained value of the coefficient of determination indicates that the independent variables of

the model (information literacy and evidence-based nursing) could justify about 39% of the changes in the attitude toward medication errors.

Durbin–Watson test was used to investigate the independence of residuals (lack of serial correlation between residuals or error). The value of this test in our study was obtained 1.71, which is in the acceptable range (1.5 to 2.5) and it can be stated that the residuals have relative independence and there is no serial correlation between them. Table 2 reports the values of the collinearity between the independent variables. If the values of the variance inflation factor are less than 2 and the tolerance statistic is greater than 0.50, we can state that there is no collinearity between the predictor variables. The results show that all values of variance inflation factor are less than 2 and all values of tolerance statistic are greater than 0.50, which is a good value, and show lack of collinearity between the independent variables.

The obtained results showed that both predictor variables of information literacy and evidence-based nursing had an effect on attitude toward medication errors and this effect was confirmed ($p < 0.05$). The direction of the effect of information literacy and evidence-based nursing on attitudes toward medication errors is positive. Investigating the intensity of the effect of predictor variables on attitude indicates that information literacy has a greater effect on attitude than medication errors. The intensity of the effect of information literacy on attitude was

0.537 and the intensity of the effect of evidence-based nursing on attitude was 0.282. The results of the multiple regression test (coefficients) are presented in Table 3.

Multiple regression test was used to investigate the effect of independent or predictive variables (information literacy and evidence-based nursing) on the dependent variable (knowledge about medication errors). The results of the multiple regression test are presented in Table 4. Simultaneous regression was used in this regard. The F test value was obtained 40.31, which is less than 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent variable (criterion) and can significantly predict the changes in knowledge of medication errors [Table 5]. The coefficient of determination was obtained 0.23, meaning that the independent variables of the model (information literacy and evidence-based nursing) could justify about 23% of the changes in the knowledge about medication errors. The Durbin–Watson statistic value in our study was 1.93, which is within the acceptable range (1.5 to 2.5), and we can state that the residuals have relative independence and there is no serial correlation between them. The linear analysis shows that all values of variance inflation factor are less than 2 and all values of tolerance statistic are greater than 0.50, which is a good value, and show no collinearity between the independent variables.

The results indicated that both predictor variables of information literacy and evidence-based nursing had an effect on knowledge about medication errors and this effect was confirmed ($p < 0.05$). The direction of the effect of information literacy and evidence-based nursing on knowledge about medication errors was positive. Investigating the intensity of the effect of predictor variables on knowledge indicates that evidence-based nursing has a greater effect on knowledge about medication errors. The intensity of the evidence-based nursing effect on knowledge is 0.383 and the intensity of the evidence-based nursing effect

is 0.365. Simultaneous regression was used in this regard. The F test value is 38.25 which is less than the significance level of 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent (criterion) variable and can significantly predict the changes in formulating of question.

The obtained value of the coefficient of determination is 0.22, which means that the independent variables of the model (perceiving information need, information finding, and information organizing) could justify about 22% of the changes in formulating of question. The Durbin-Watson statistic in our study was 2.43, which is within the acceptable range (1.5 to 2.5) and it can be stated that the residuals have relative independence and there is no serial correlation between them. Collinearity analysis shows that all values of the variance inflation factor are less than 2 and all values of tolerance statistics are greater than 0.50 which is a good value and shows a lack of collinearity between the independent variables.

The results indicated that all three predictor variables of perceiving information need, information finding, and information organizing had an effect on formulating of question and this effect was confirmed ($p < 0.05$). The direction of perceiving information needs, information finding, and information organizing on formulating of question is positive. Investigating the intensity of the effect of predictor variables on formulating of question showed that the highest effect belonged to the variable of information finding with a coefficient of 0.316. The intensity of the effect of information organizing on formulating of question is 0.216 and the intensity of the effect of perceiving information need on formulating of question is 0.213. Multiple regression test was used to investigate the effect of independent or predictor variables (perceiving information need, information finding, and evaluation of information) on the dependent variable (finding evidence). The results of the

Table 3: Regression test coefficients to predict the attitude of medication errors based on the information literacy and evidence-based nursing

Independent variable	Non-standard coefficient	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance statistic	Variance inflation
Constant value	1.54	0.217	–	7.10	<0.001	–	–
Information literacy	0.562	0.055	0.537	10.16	<0.001	1.31	0.763
Evidence-based nursing	0.291	0.050	0.282	5.83	<0.001	1.31	0.763

DW=1.71, $R^2=0.39$, $p \leq 0.001$ and $F= 59.28$

Table 4: Regression test coefficients to predict the knowledge on medication errors based on the information literacy and evidence-based nursing

Independent variable	Non-standard coefficient	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance statistic	Variance inflation
Constant value	1.78	0.098	–	7.10	<0.001	–	–
Information literacy	0.213	0.049	0.365	4.34	<0.001	1.31	0.763
Evidence-based nursing	0.224	0.048	0.383	4.66	<0.001	1.31	0.763

DW=1.93, $R^2=0.23$, $F= 40.31$

Table 5: Regression analysis to predict formulating of question based on the perceiving information need, information finding, and information organizing

Independent variable	Non-standard coefficient	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance statistic	Variance inflation
Constant value	1.33	0.185	–	7.18	<0.001	–	–
perceiving information need	0.122	0.050	0.213	2.43	0.016	0.648	1.54
Information finding	0.164	0.043	0.316	2.83	<0.001	0.733	1.36
Information organizing	0.238	0.105	0.216	2.28	0.024	0.557	1.80

DW=2.243, R²= 0.22, p<0.001 and F= 38.25**Table 6: Regression Test to predict evidence finding based on perceiving information need, information finding, and evaluation of information**

Independent variable	Non-standard coefficient	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance statistic	Variance inflation
Constant value	1.54	0.240	–	6.42	<0.001	–	–
perceiving information need	0.362	0.065	0.481	5356	<0.001	0.712	1.54
Information finding	0.094	0.038	0.187	2.47	0.018	0.695	1.36
Evaluation of information	0.365	0.109	0.375	3.36	<0.001	0.810	1.80

DW=2.16, R²= 0.31, p<0.001 and F= 58.73

multiple regression test are presented in Table 6. Simultaneous regression was used in this regard. The F test value is 58.73, which is lower than the significance level of 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with dependent variable (criterion) and can significantly predict the changes in finding evidence.

The value of the coefficient of determination was obtained at 0.31, which means that the independent variables of the model (perceiving information need, information finding, and evaluation of information) could justify about 31% of the changes in finding evidence. The Durbin–Watson statistic in our study was obtained at 2.16, which is within the acceptable range (1.5 to 2.5), and it can be stated that the residuals have relative independence and there is no serial correlation between them. Collinearity analysis shows that all values of the variance inflation factor are less than 2 and all values of tolerance statistics are greater than 0.50 which is a good value and there is no collinearity between the independent variables.

The results indicated that all three predictor variables of perceiving information need, information finding, and evaluation of information had an effect on formulating of question and this effect was confirmed ($p < 0.05$). The direction of perceiving information needs, information finding, and evaluation of information on formulating of question is positive. Investigating the intensity of the effect of predictor variables on the formulating of question showed that the highest effect belonged to the perceiving information need with a coefficient of 0.481. The intensity of the effect of evaluation of information on evidence finding is 0.375 and the intensity of the effect of information finding on evidence finding is 0.187. Multiple regression tests were used to investigate the effect of independent or predictor variables (perceiving information

need, evaluation of information, and information organizing) on the dependent variable (critical evaluation). The results of the multiple regression test are presented in Table 6.

The F test value is 36.69 which is lower than the significance level of 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent variable (criterion) and can significantly predict the changes in the critically evaluation of evidence. The value of the coefficient of determination was obtained at 0.32, which means that the independent variables of the model (perceiving information need, evaluation of information, and information organizing) could justify about 32% of the changes in critically evaluation of evidence. The Durbin–Watson statistic in our study was obtained at 2.41, which is within the acceptable range (1.5 to 2.5), and it can be stated that the residuals have relative independence and there is no serial correlation between them. Collinearity analysis shows that all values of the variance inflation factor are less than 2 and all values of tolerance statistics are greater than 0.50, which is a good value and there is no collinearity between the independent variables.

The results indicated that the effect of two predictor variables of evaluation of information and information organizing on the dependent variable of critical evaluation of evidence is confirmed ($p < 0.05$), but the effect of perceiving information need on critical evaluation of evidence is rejected ($p > 0.05$). The direction of the effect of perceiving information needs and information organizing on the dependent variable of critical evaluation of evidence is positive.

Investigating the intensity of the effect of predictor variables on critical evaluation of evidence showed that the highest effect belonged to the evaluation of information with a coefficient of

0.541. The intensity of the effect of information organizing on critical evaluation of evidence is 0.365 and the intensity of the effect of information organizing on critical evaluation of evidence is 0.365. Multiple regression test was used to investigate the effect of independent or predictor variables (perceiving information need, evaluation (applying evidence)). The results of the multiple regression test are presented in Table 7. The F test value is 14.21, which is lower than the significance level of 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent variable (criterion) and can significantly predict the changes in applying evidence. The value of the coefficient of determination was obtained at 0.17, which means that the independent variables of the model (perceiving information need, evaluation of information, and information exchange and disseminating) could justify about 17% of the changes in critical evaluation of evidence. The Durbin–Watson statistic in our study was obtained at 1.81, which is within the acceptable range (1.5 to 2.5), and it can be stated that the residuals have relative independence and there is no serial correlation between them. Collinearity analysis shows that all values of variance inflation factor are less than 2 and all values of tolerance statistics are greater than 0.50 which is a good value and there is no collinearity between the independent variables of information, and information exchange and disseminating) on the dependent variable.

The results indicated that the effect of two predictor variables of evaluation of information and information exchange and disseminating on the dependent variable of applying evidence is confirmed ($p < 0.05$), but the effect of perceiving information need on applying evaluation is rejected ($p > 0.05$). The direction of the effect of perceiving information needs and information exchange and disseminating on the dependent variable of applying evidence is positive. Investigating the intensity of the effect of predictor variables on applying evidence showed that

the highest effect belonged to the information exchange and disseminating with a coefficient of 0.344. The intensity of the effect of the evaluation of information on applying evidence is 0.189. Multiple regression test was used to investigate the effect of independent or predictor variables (perceiving information need, evaluation of information and information exchange, and disseminating) on the dependent variable (evaluation of outcomes). The results of the multiple regression test are presented in Table 8. The F test value is 23.54, which is lower than the significance level of 0.05 ($p < 0.05$), meaning that the regression model is appropriate and the predictor variables are correlated with the dependent variable (criterion) and can significantly predict the changes in the evaluation of outcomes. The value of the coefficient of determination was obtained at 0.29, which means that the independent variables of the model (perceiving information need, evaluation of information and information exchange and disseminating) could justify about 29% of the changes in the evaluation of outcomes. The Durbin–Watson statistic in our study was obtained at 2.26, which is within the acceptable range (1.5 to 2.5), and it can be stated that the residuals have relative independence and there is no serial correlation between them. Collinearity analysis shows that all values of the variance inflation factor are less than 2 and all values of tolerance statistic are greater than 0.50 which is a good value and there is no collinearity between the independent variables.

The results showed that both predictors of information organizing and information exchange and disseminating had an effect on the evaluation of the outcomes and this effect was confirmed ($p < 0.05$). The direction of information organizing and information exchange and disseminating on the evaluation of outcomes was also direct. Investigating the intensity of the effect of predictor variables on the evaluation of outcomes shows that the highest effect belonged to information exchange

Table 7: Regression test to predict critically evaluation of evidence based on perceiving information need, evaluation of information, and information organizing

Independent variable	Non-standard coefficient	Standard error	Standard coefficient	T statistic	Significance level	Collinearity indices	
						Variance tolerance	Variance inflation
Constant value	73.1	0.210	–	8.23	<0.001	–	–
Perceiving information need	0.088	0.052	0.127	1.68	0.094	0.812	1.23
Information evaluation	0.427	0.091	0.541	4.72	<0.001	0.745	1.34
Information organizing	0.564	0.187	0.365	3.16	0.003	0.656	1.52

63.69=F and 0.001≥p • 0.32=R² • 2.41=DW

Table 8: Regression test to predict applying evidence based on perceiving information need, evaluation of information, and information exchange and disseminating

Independent variable	Non-standard coefficients	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance	Variance inflation
Constant value	1.44	0.189	–	7.62	<0.001	–	–
perceiving information need	0.086	0.061	0.098	1.40	0.162	0.869	1.15
Information evaluating	0.118	0.048	0.189	2.47	0.015	0.748	1.34
Information exchange and disseminating	0.238	0.083	0.344	2.87	0.005	0.754	1.33

14.21=F and 0.001≥p • 0.17=R² • 1.181=DW

Table 9: Regression test to predict evaluation of evidence based on information organizing and information exchange and disseminating

Independent variable	Non-standard coefficients	Standard error	Standard coefficients	T statistic	Significance level	Collinearity indices	
						Variance tolerance statistic	Variance inflation
Constant value	1.16	0.310	–	3.74	<0.001	–	–
Information organizing	0.615	0.102	0.385	6.02	<0.001	0.847	1.18
Information exchange and disseminating	0.538	0.084	0.411	6.43	<0.001	0.847	1.18

DW=2.26, R²=0.29, p≤0.001 and F= 23.54

and disseminating with a coefficient of 0.411. The intensity of the effect of information organizing on the evaluation of the outcomes is 0.385 [Table 9].

Discussion and Conclusions

The results show that there is a significant relationship between information literacy and evidence-based nursing ($p < 0.05$). The direction of the relationship is positive, meaning that increased information literacy is associated with increased evidence-based nursing, and vice versa. The intensity of the relationship is moderate and 0.37. According to the results, information literacy is correlated with all five components of evidence-based nursing ($p < 0.05$) and the direction of this relationship is positive.

A comparison of the intensity of correlations shows that information literacy has the strongest relationship with formulating of the question with a coefficient of 0.41 and critically evaluation of evidence with a coefficient of 0.35. The results are in line with those of the studies conducted by Farrokhzadian,^[22] Sharif Moghaddam^[17], and Azami and Soltani.^[21] The results of the Pearson correlation test show that there is a relationship between information literacy and nurses' knowledge and attitude toward medication errors ($p < 0.05$). The direction of the relationship is positive, which means that increasing information literacy is associated with knowledge and attitudes toward medication errors. The results are in line with those of the studies conducted by Sharbaafchi Zadeh,^[23] Grandy,^[24] and Zhu.^[25] The intensity of the relationship between information literacy and knowledge and attitude is 0.38 and 0.49, respectively. All components of information literacy are associated with attitude and knowledge. The results also show that there is a relationship between evidence-based nursing with their knowledge and attitude towards medication errors ($p < 0.05$). The direction of the relationship is positive, which means that evidence-based nursing increases their knowledge and attitudes toward medication errors. The intensity of evidence-based nursing relationships with nurses' knowledge and attitude is 0.51 and 0.46, respectively. In fact, all evidence-based nursing components are associated with nurses' attitudes and knowledge about medication errors. The results are in line with those of the studies conducted by Askari,^[26] Alemu,^[27] and Carlton.^[28]

The results indicate that both predictor variables of information literacy and evidence-based nursing have influenced nurses' knowledge about medication errors. Investigating the intensity of the effect of predictor variables on knowledge indicates that evidence-based nursing has a greater effect on nurses' knowledge about medication errors. The results indicated that all three predictor variables of perceiving information need, information finding, and information organizing had an effect on formulating of question and this effect was confirmed ($p < 0.05$). The direction of the effect of perceiving information needs, information finding, and information organizing on formulating of questions are positive. Investigating the intensity of the effect of predictor variables on formulating of question showed that the most effect on formulating of question belonged to information finding with a coefficient of 0.316. The intensity of the effect of information organizing on formulating of question is 0.221 and the intensity of the effect of perceiving information need on formulating of question is 0.221. The results of this study are in line with those of the study conducted by Azami and Soltani.^[21]

The results indicated that all three predictor variables of information literacy, information finding, and evaluation of information had an effect on finding evidence and this effect was confirmed ($p < 0.05$). The direction of the effect of perceiving information need, information finding, and evaluation of information on evidence is positive. Investigating the intensity of the effect of the predictor variables on the finding evidence shows that the greatest effect belonged to perceiving information need with a coefficient of 0.481. The intensity of the effect of evaluation of information on evidence finding is 0.375 and the intensity of information finding on evidence finding is 0.187. The results of this research are in line with those of the research conducted by Farrokhzadian.^[22] The results indicate that the effect of two predictor variables of evaluation of information and information organizing on the dependent variable of critical evaluation of evidence is conformed ($p < 0.05$), but the effect of perceiving information need on critical evaluation of evidence is rejected ($p > 0.05$). The direction of the effect of evaluation of information and information organizing on the dependent variable of critical evaluation of evidence is positive. Investigating the intensity of the effect of predictor variables on critical evaluation of evidence shows that the greatest effect belonged to information exchange and disseminating with a coefficient of 0.344 and the intensity of the effect of information organizing on the critical evaluation of evidence is 0.189. The results of this

study are in line with those of the study conducted by Azami and Soltani.^[21] The results showed that both predictor variables of information organizing and information exchange and disseminating had an effect on the evaluation of the outcomes and this effect was confirmed ($p < 0.05$). The direction of the effect of information organizing and information exchange and disseminating on the evaluation of the outcomes is positive. Investigating the intensity of the effect of predictor variables on the evaluation of outcomes shows that the highest effect on the evaluation of the outcomes belonged to information exchange and disseminating with a coefficient of 0.411. The intensity of the effect of information organizing on the evaluation of the outcomes is 0.385. The results of this study were in line with those of the study conducted by Farrokhzadian.^[22]

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Conflicts of interest

There are no conflicts of interest.

References

1. Jaafariipooyan E, Madady Z. Nursing medication errors: Causes and solutions (A review study). *Hospital* 2015;14:101-10. [In Persian].
2. Lee E, Kim Y. The relationship of moral sensitivity and patient safety attitudes with nursing students' perceptions of disclosure of patient safety incidents: A cross-sectional study. *PLoS One* 2020;15:e0227585.
3. Wondmieneh A, Alemu W, Tadele N, Demis A. Medication administration errors and contributing factors among nurses: A cross sectional study in tertiary hospitals, Addis Ababa, Ethiopia. *BMC Nurs* 2020;19:4.
4. Dodds L, Katusiime B, Shamim A, Fleming G, Thomas T. An investigation into the number and nature of the urgent care consultations managed and referred by community pharmacists in South-East England. *Prim Health Care Res Dev* 2020;21:E5.
5. Escrivá Gracia J, Brage Serrano R, Fernández Garrido J. Medication errors and drug knowledge gaps among critical-care nurses: A mixed multi-method study. *BMC Health Serv Res* 2019;19:640.
6. Musharyanti L, Claramita M, Haryanti F, Dwiprahasto I. Why do nursing students make medication errors? A qualitative study in Indonesia. *J Taibah Univ Med Sci* 2019;14:282-8.
7. Cheraghi MA, Nikbakhat Nasabadi AR, Mohammad Nejad E, Salari A, Ehsani Kouhi Kheyli SR. Medication errors among nurses in intensive care units (ICU). *J Mazandaran Univ Med Sci* 2012;21:115-9. [in Persian].
8. Lecturer LC. Reducing medication errors in nursing practice. *Nurs Stand* 2015;29:60-72.
9. Ghorbanpour Diz M, Mohammad Khan Kermanshahi S, Sedaghat M. Evaluation of self-report of the medication errors and its barriers in pediatric wards. *Iran J Pediatr Nurs* 2016;3:71-80. [in Persian].
10. Makary MA, Michael D. Medical error—the third leading cause of death in the US. *Br Med J* 2016;21:353-8.
11. Ramezani T, Hosseini Almadvari SM, Fallahzadeh H, Dehghani Tafti A. Type and rate of medication errors and their causes from the perspectives of neonatal and neonatal intensive care units nurses in Yazd Hospitals. *Community Health J* 2014;10:63-71. [in Persian].
12. Salehi S, Mohmedie Karbalaie A, Abedi H. A study of the implementation rate of evidence-based nursing cares by nurses in state hospitals in Ahwaz in 2011. *Evidence Based Care* 2013;3:7-16. [in Persian].
13. Sheikhalipour Z, Fathiazar E, Lotfi M, Pakpour V, Aghajari P, Ali Mokhtari Z. Concept of evidence based nursing and nursing education. *Iran J Med Educ* 2014;14:507-16. [in Persian].
14. Lafuente-Lafuente C, Leitao C, Kilani I, Kacher Z, Engels C, Canoui-Poitrine F, *et al.* Knowledge and use of evidence-based medicine in daily practice by health professionals: A cross-sectional survey. *BMJ Open* 2019;9:e025224.
15. Chien LY. Evidence-based practice and nursing research. *J Nurs Res* 2019;27:e29.
16. Farrokhzadian J, Khajouei R, Ahmadian L. Evaluating factors associated with implementing evidence-based practice in nursing. *J Eval Clin Pract* 2015;21:1107-13. [in Persian].
17. Sharif Moghadam H, Salami M, Narimani R, Razmkhah M. The rate of information literacy of faculty members and PhD students of Faculty of Nursing and Midwifery based on successful evidence health care. *J Nurs Educ* 2016;5:58-65. [in Persian].
18. Ansari M. The relationship between information literacy and evidence-based qualifications nurses working in special departments of Tehran University of medical sciences hospitals [dissertation]. Tehran: Islamic Azad University Central Tehran Branch; 2017. [In Persian].
19. Ellis P. Evidence-based Practice in Nursing. 4th ed.. New Delhi: SAGE publications, 2019.
20. Azami M, Delkhosh Y. The effect of information literacy training on self-efficacy of nursing graduate students of Kerman University of Medical Sciences. *J Biochem Technol* 2018;2:185-93.
21. Azami M, Soltani M. Study the Relationship between Information Literacy and Medicine Based on its Influence on Knowledge and Attitudes of Clinical Residents of Kerman University of Medical Sciences on Medical Error. Kerman: Kerman University of Medical Sciences; 2018. p. 97. [In Persian].
22. Farrokhzadian J, Ahmadian L, Khajouei R, Mangolian Sharbabaki P. Information literacy and training needs of nursing managers for evidence-based practice. *Iran J Nurs* 2016;29:43-56. [in Persian].
23. Sharbaafchi Zadeh N, Soori S, Rostami Z, Aghilidehkordi G. Occurrence and reporting of nurses' medication errors in a teaching hospital in Isfahan. *JHA* 2019;21:75-86.
24. Grandy R. Investigating the effectiveness of a credit-bearing information literacy course in reducing library anxiety for adult learners. *Commun Inf Lit* 2019;13:23-42.
25. Zhu S, Yang HH, MacLeod J, Yu L, Wu D. Investigating teenage students' information literacy in China: A social cognitive theory perspective. *Asia Pac Edu Res* 2019;28:251-63.
26. Askari R, Mahjoub H. Ranking of the causes of medication

- errors in the viewpoints of nurses in selected hospitals affiliated with Yazd University of Medical Sciences, Iran. *Manage Strat Health Syst* 2017;2:154-61. [In Persian].
27. Alemu W, Belachew T, Yimam I. Medicinal administration error and contributing factors: A cross sectional study in two public hospitals in southern Ethiopia. *Int J Afr Nurs Sci* 2017;7:68-74.
28. Carlton G, Blegen MA. Medicinal-related error: A literature review of incidence and antecedents. *Annu Rev Nurs Res* 2006;24:19-38.