



## Prevalence of Depression Among Nurses of Iran: A Meta-analysis

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### ABSTRACT

**Background:** Depression is one of the most common and serious disorders which threatens the mental and physical health of the nurses. This article investigated prevalence of depression among the nurses of Iran using meta-analysis.

**Methods:** This meta-analysis study was done in 2021 using a random-effects model. Data were collected from January 2000 to June 21, 2021, from PubMed, Web of Science, Scopus, Magiran, SID databases and Google Scholar search engine. The data were analyzed using CMA software (Version 2.2.064, the US, Biostat Company).

**Results:** 18 articles were retrieved. The total prevalence rate of depression in Iranian nurses was 12 % [95 % CI= 8.03-17.10]. The highest prevalence rate of depression among nurses was 40.90 % [95 % CI= 32.60-49.70] in Razavi Khorasan, in 2020, and the lowest prevalence rate was 1.70 % [95 % CI= 0.06-4.40] in Lorestan, in 2017. A significant statistical correlation was observed between the prevalence of depression, the sample size, and the work experience ( $P$ -value < 0.05). Moreover, we found that the highest rate of depression was based on BDI (Beck's Depression Inventory) questionnaire, and the eastern region of Iran.

**Conclusion:** According to the results, depression has prevailed among one tenth of the Iranian nurses. The finding of this study can help improve the decision-making process for treating depression in Iranian nurses.

**Key words:** Depression, Nurse, Prevalence, Iran, Meta-analysis

### Citation

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## Introduction

Hospital is a very complex social organization, which using equipment and human resources, has a vital role in maintaining and enhancing the community's health. It is a key sign of a civilized society, and a place where people with different specialties use various, complex medical and par-medical equipment to help their fellow citizens. The primary purpose of the hospital is to meet society's health requirements efficiently. Therefore, hospitals must pursue health-related, medical, educational, and research goals to provide optimal diagnostic and therapeutic care to patients (1). Health care staff has constant contact with patients and clients during the day. The interplay of these factors increases mental stress on the health care professionals, such as the nursing staff (2). In Iran, about 80 percent of the health care staff is nurses. Nurses are in constant contact with patients and those having incurable diseases; therefore, their job is categorized among stressful jobs (3). Out of 130 occupations surveyed, nursing is listed 27th due to mental health and stress problems (4).

Because of the wide scope of nursing activities and the interdisciplinary nature of this profession, nurses are faced with major problems and pressures. Some examples include inter professional and role conflict with other members of the healthcare team, poor interactions with colleagues, the wide range of nursing tasks, and management of the physical and psychological aspects of patients and their families. These factors can hinder the career of nurses and lead to mood changes, and in particular, depression (5-8).

Depression is a common psychological disorder, characterized by low mood, lack of energy, loss of strength, hopelessness, loss of interest, and pessimism. Severity of depression can vary from mild distress to complete avoidance of everyday activities (9).

Accumulation of unrelieved stress in nurses can cause chronic fatigue and depression due to frustration. Depression accounts for 30 % of the lower productivity (10). Depression induced by job stress also leads to financial losses in the form of treatment expenses, lost work time, and loss of work

productivity. Absenteeism is another consequence of depression in nurses, and is becoming increasingly prevalent (11, 12). Depressed nurses are more sensitive to job accidents and injuries, and may showed little accuracy in their work (10).

The prevalence of depression among nurses varies depending on work conditions, area of specialization, and work environment. For example, Lin et al. (13) (2010) reported that the prevalence of severe depression in Taiwan was 7.10 % among 154 nurses participating in the article. Boya et.al (14) (2008) estimated that the prevalence of depression in Turkey was 2.50 % among the nurses working in the private health sector.

Paying attention to the nurses' mental health is important. Promoting the mental health in the nurses is of great importance with respect to the quantity and quality of the care provided by them. Thus, the purpose of this article was to carry out a meta-analysis of the prevalence of depression among the Iranian nursing staff.

## Materials and Methods

This study is a meta-analysis of the prevalence of depression among Iranian nurses which was conducted in 2021. The systematic review protocol of this study registered in PROSPERO (ID: 272693). The study design and reporting were conducted in line with the PRISMA statement.

### Search Strategy

During the search, studies related to the subject of the article, published until June 21 2021, were systematically explored through five databases involving PubMed, Web of Science, Scopus, Magiran, and SID, with the help of Google Scholar. Search keywords included depression, depressed, depressive, dysthymia, dysthymic, nurses, hospital, prevalence, frequency, epidemiology, Iran and Iranian along with and/or operators. In addition, hand searching was done and references of the studies were used to find more appropriate articles. The duplicates were removed by Endnote software.

### Study selection and data extraction

Inclusion criteria were original Persian and English articles published until 21 June 21, 2021 with

full-texts, having descriptive, cross sectional, and case study designs. Exclusion criteria were studies in a language other than Persian or English, published after June 21, 2021. In addition to studies with designs of thesis, case series, reviews, books, letters to the editor, case-control, randomized controlled trials, and qualitative studies were excluded from this study.

### Quality assessment

A checklist was designed for collecting data. This checklist included the last name of the first author, publication year, research place, the purpose of article, sample size, method, and depression prevalence in nurses.

The STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) checklist was used to measure the quality of articles. This checklist included 22 questions which investigated the article's methodology, such as sample size, objectives of the study, statistical tests, measuring variables, and validity and reliability of the measurement instrument. Maximum score in this checklist was 44. These studies were categorized into three groups: Low (0-15), medium (16-30) and high (31-44) (15). Articles were scored independently by four researchers (MA, SP, RC and

MA) using a quality scoreboard. If there were differences, the article would be reviewed by a fifth researcher (PI). Finally, only the articles with moderate and high quality were included in this study.

Data were extracted from based on article title, last name of the first author, publication year, Journal, average age, instrument, work experience, sample size, location of the study, and depression prevalence, and an Excel document was used to enter information.

### Statistical Analysis

Comprehensive meta-analysis software (version 2.2.064, the US, Biostat Company) was used for analyzing data. Articles heterogeneity was examined using Cochran's Q test and the  $I^2$  index. The  $I^2$  index obtained was 94.10 %. Thus, a random effect model was used in this review. Egger's test was used to help detect bias of publication and a p-value of 0.02 was obtained. This indicates that there was publication bias in this study (Figure 2).

Correlation between variables was evaluated using meta-regression function. Forest plot with a 95 % CI was calculated for measuring point estimates of the prevalence of depression among Iranian nurses.



**Table 1.** Characteristics of the studies

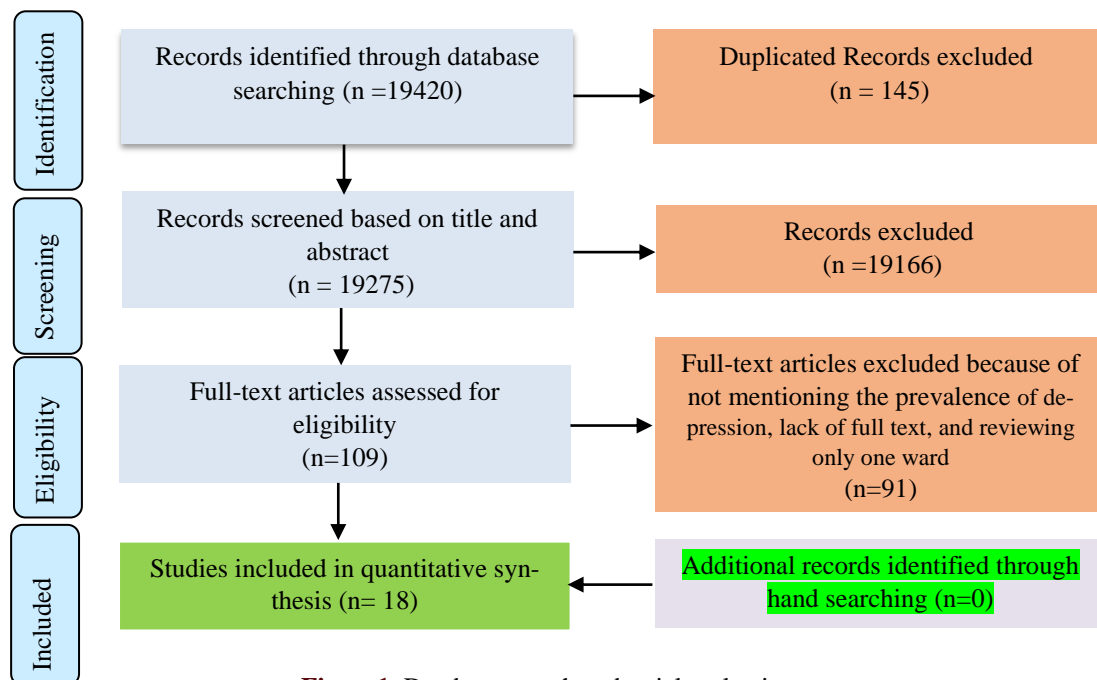
First author / ref	Year	Province	Sample size	Prevalence depression	Instruments	Journal	Age average	Working experience	Quality score
Alipour (16)	2015	Fars	142	32.0000	DASS <sup>1</sup>	Pajouhan Scientific Journal	35.0000 ± 8.0000	12.0000 ± 9.0000	38
Zandi (17)	2011	Tehran	272	24.9000	DASS	Iranian Journal of Military Medicine	-	4.4000 ± 2.0000	37
Kassani (18)	2014	Ilam	191	34.0000	BDI <sup>2</sup>	Quarterly Journal of Nursing Management	-	-	18
Ariapooran (19)	2019	Hamedan	247	17.8000	BDI	Iranian Journal of Nursing and Midwifery Research	30.3000 ± 5.4000	6.2000 ± 4.0000	43
Sarboozi Ho-sein abadi (20)	2020	Razavi Khorasan	125	51.1000	BDI	Journal of Military Medicine	29.4000 ± 6.5000	9.7000 ± 7.0000	39
Roughani (21)	2019	Ilam	110	31.8000	BDI	Journal of Pharmaceutical Research International	30.2000 ± 8.2000	1.1000 ± 0.3000	40
Kavari (22)	2006	Fars	130	26.9000	BDI	Middle East Journal of Family Medicine	-	-	16
Khani (23)	2016	Razavi Khorasan	196	26.0000	BDI	International Journal of Medical Reviews	32.1000 ± 8.0000	-	35
Khajeh nasiri (24)	2000	Tehran	130	26.9000	BDI	Tehran University Medical Journal	-	-	16
Dehghani (25)	2009	Fars	311	16.4000	Zung Self-Rating Depression Scale	Iran Occupational Health	31.3000 ± 8.0000	12.9000 ± 4.3000	40
Mahmodi (26)	2012	Kurdistan	380	23.3000	BDI	Iranian Journal of Nursing Research	39.6000 ± 9.4000	-	35
Arefian (27)	2009	Tehran	400	36.1000	BDI	International Journal of Cancer Management	-	-	16
Mirmohammadi (28)	2009	Yazd	110	43.7000	BDI	Occupational Medicine Quarterly Journal	39.2000 ± 5.5000	16.1000 ± 5.3000	17
Khamseh (29)	2011	Tehran	413	25.8000	DASS	J Holist Nurs Midwifery	-	-	16
Sagharjoghi Farahani (30)	2017	Lorestan	241	4.1000	BDI	J Nurs Midwifery Khorramabad	-	-	43

<sup>1</sup> Depression, Anxiety and Stress Scale

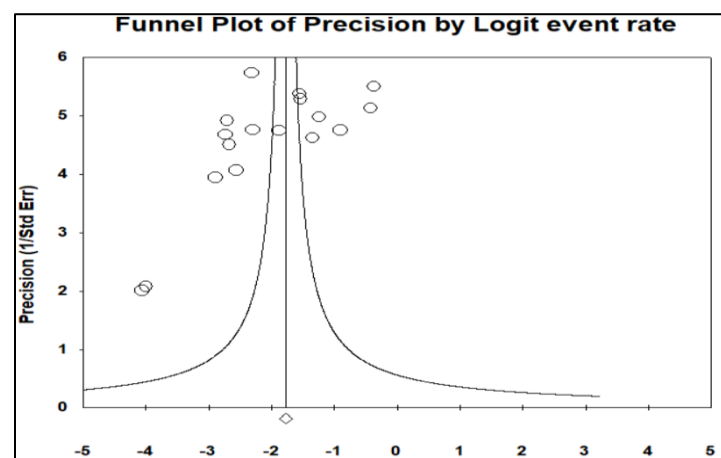
<sup>2</sup> Beck's Depression Inventory



First author / ref	Year	Province	Sample size	Prevalence depression	Instruments	Journal	Age average	Working experience	Quality score
Khodadadi (31)	2016	Eastern Azerbaijan	242	4.4000	DASS	International Journal of Medical Research & Health Sciences	33.1000 ± 6.1000	8.2000 ± 5.8000	40
Khalilzadeh (32)	2005	Western Azerbaijan	200	35.0000	BDI	Nurs Midwifery J	-	-	18
Kazemi (33)	2011	Tehran	335	21.7000	BDI	Nurse and Physician Within War	31.4000 ± 7.5000	12.3000	36



**Figure1.** Database search and article selection process



**Figure 2.** Egger's test for publication bias

## Results

By searching the databases, 19420 articles were found. By reading the titles and abstracts, 145 articles were removed due to duplication, and 19166 papers were excluded because of their irrelevance to the study. Then by reviewing the full texts of the studies, 91 studies were excluded because of the lack of full text, not mentioning the prevalence of depression and reviewing only one ward. No article was found through hand searching. Finally, 18 articles were entered into meta-analysis (Figure 1) (Table 1).

In this meta-analysis study, depression prevalence among nursing staff in Iran from 2000 to June 21, 2021 was investigated. Articles published in different journals, such as Iranian Journal of Nursing Research, International Journal of Medical Reviews, Tehran University Medical Journal, etc. were reviewed. Most studies were done in Tehran, Fars, Razavi Khorasan, and Ilam provinces (Figure 3), in 2009 and 2011 (Figure 4).

The random effect model showed that depression prevalence in Iranian nursing staff was 12 percent (8.30-17.10 %: 95 % CI). The highest de-

pression prevalence rate among nurses was 40.90 % (32.60-49.70 %: 95 % CI) in Razavi Khorasan as reported by Sarbooz Hosein Abadi (20), while the lowest rate was 1.7 percent (0.06-4.40 %: 95 % CI) in Lorestan as reported by Sagharjoghi Farahani (30) (Figure 5).

The results were summarized by geographic region, instruments, sample size, and quality (Table 2). Depression in nurses was most prevalent in the eastern region of Iran. The prevalence rate of depression was higher using BDI (Beck's Depression Inventory) questionnaire. Finally, studies with medium quality reported higher rates than those with higher quality.

The heterogeneity test results show that there is a high level of heterogeneity among the articles (P-value= 0.0001). Therefore, heterogeneity sources were investigated using the function of meta-regression. Table 3, figures 6 and 7 indicated that sample size and work experience contributed to the heterogeneity of articles on depression prevalence among Iranian nurses.

**Table 2.** Analyses of subgroup of the included articles

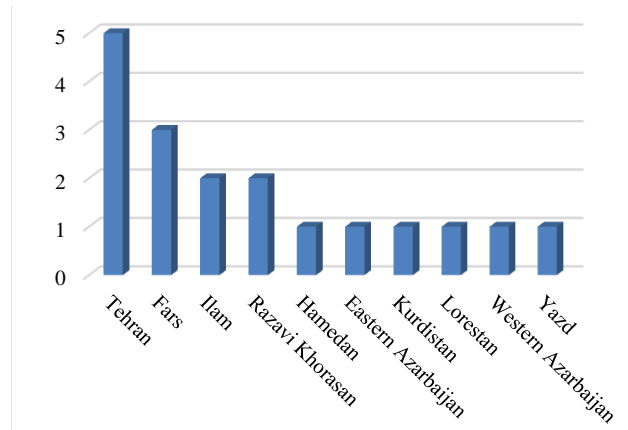
Variable	No. studies	Prevalence 95 % CI	Heterogeneity I <sup>2</sup>	P
Geographic region	Center	5	9.4000 % (6.1000- 14.1000)	84.7000 ≤ 0.0010*
	South	3	14.0000 % (5.8000-30.2000)	93.3000 ≤ 0.0010*
	North	2	6.1000 % (0.6000-41.6000)	95.5000 ≤ 0.0010*
	West	5	9.2000 % (4.1000-19.4000)	94.0000 ≤ 0.0010*
	East	3	29.2000 % (14.0000-51.3000)	94.3000 ≤ 0.0010*
Instruments	DASS	4	7.7000 % (3.3000-17.0000)	93.0000 ≤ 0.0010*
	BDI	13	14.5000 % (9.5000-21.4000)	94.1000 ≤ 0.0010*
	Zung	1	5.3000 % (3.3000-8.4000)	0.0000 1.0000
Quality	High	10	9.8000 % (5.3000-17.3000)	94.9000 ≤ 0.0010*
	Moderate	8	14.9000 % (9.2000-23.2000)	93.6000 ≤ 0.0010*

\*P-value< 0.05

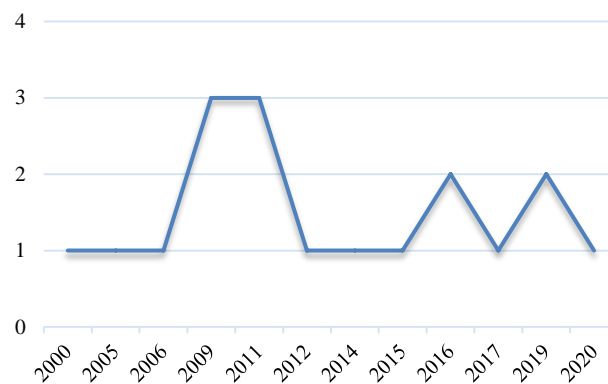
**Table 3.** Results of Meta-regression

Variable	Point estimate	SE	P
Year	0.0170	0.0090	0.0600
Sample	- 0.0060	0.0004	0.0010*
Age average	0.0001	0.0006	0.8300
Work experience	0.0400	0.0600	0.0010*

\*P-value< 0.05

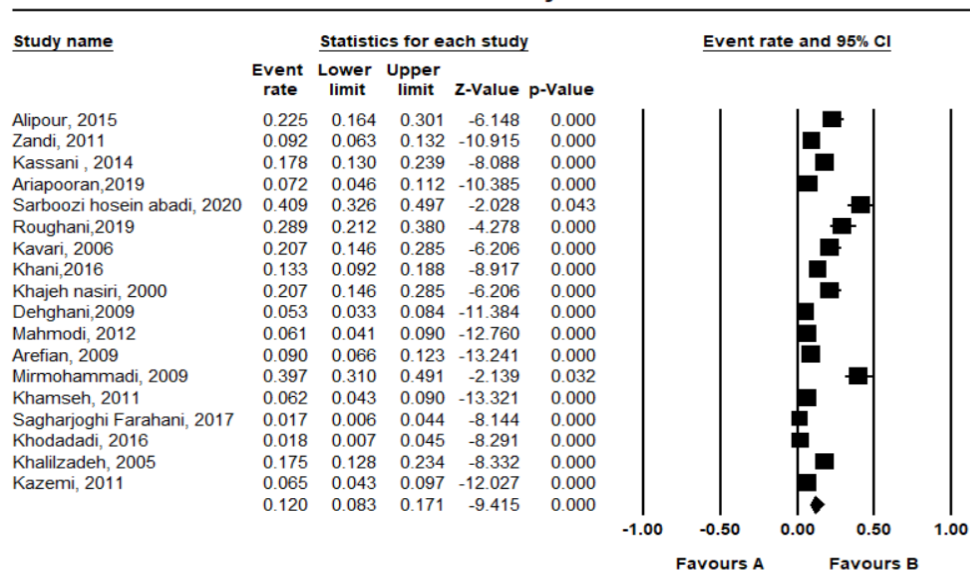


**Figures 3.** Frequency distribution of the studied provinces



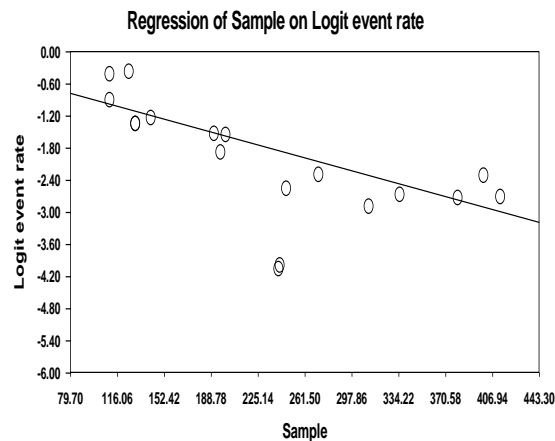
**Figures 4.** Frequency distribution of the studied years

### Meta Analysis



**Figure 5.** Forest plot of the included articles





**Figures 6.** Results of the analyses of meta-regression (sample)



**Figures 7.** Results of the analyses of meta-regression (work experience)

## Discussion

The aim of this article was to determine depression prevalence in Iranian nurses. A total of 18 articles in the period from 2000 to June 21, 2021 indicated depression prevalence among Iranian nursing staff in hospitals. Based on the random effect model, the prevalence of depression in Iranian nurses was calculated to be 12 percent which is under the number reported in China (38 %) (34), Hong Kong (35.80 %) (35), and Brazil (45 %) (36). Moreover, WHO estimated that the prevalence in society is between 15 % and 20 % and among nurses is 15 % to 30 % (37). The depression prevalence among Iranian nurses was determined to be lower than other countries. The different rate of prevalence in studies is because of the

difference in culture, context, population, the wards of a hospital, and work environment. Ignoring the symptoms of depression presented by nursing professionals, not only increases physical and emotional stress on the individual, but may also lead to poor quality of the patient care and heavier workloads at the centers (38).

In this study, there was publication bias in the articles under review. Scientific journals may be reluctant to publish research papers with a high prevalence of depression. Moreover, recently, a number of studies on depression in Iranian nurses have been conducted. However, the results of the articles show high heterogeneity. The tools used to measure depression in nurses may be another important element. According to different question-



naires, different nurses have been diagnosed with depression. Therefore, the different results of the studies reviewed may be partly due to the differences in the instruments used, including Beck's depression inventory, Depression Anxiety Stress Scales (DASS), and the Zung Self-rating depression scale.

A small number of systematic and meta-analysis articles have determined depression prevalence in Iranian nurses and reported different results (10, 39-40). Differences in the quality of articles were examined, and their inclusion and exclusion criteria led to different findings. As an example, Mohammadi et al. (10). by reviewing articles published in 4 databases (SID, Magiran, PubMed and Science Direct) and Google Scholar found 12 articles related to the prevalence of depression in Iranian nurses in the period from April 2000 to March 2016. The prevalence in this study was reported to be about 29.90 %. In this article, the studies surveying the prevalence of the nurses' depression in one ward of hospital were reviewed as well. In this paper, depression prevalence among Iranian nurses in all wards of hospital has been examined.

The results of this research showed that an increase in sample size decreases the prevalence of depression among nurses by 0.006. Therefore, studies on prevalence of depression among nurses must make sure that the sample size is representative and that appropriate and correct sampling methods are used.

This article determined that depression prevalence among Iranian nurses increases by 0.04 for each unit increase in the work experience. This result isn't consistent with the finding of Mahmodi et al. (26), and Alipour et al. (16). Demir et al. (41). (2002) showed work experience can reduce work-related stress. In addition, people with higher work experience are more likely to face stressful situations

Nursing plays a vital role in healthcare system, and patient care is highly dependent on the nurses' ability to provide the optimal and best care possible (42). It is increasingly recognized that nurses are affected by signs of stress and depression (43). The formulation of short- and long-term supportive

strategies and interventions aimed at improving the psychological needs of the nursing professionals should be a top priority in fighting physical and mental fatigue resulting from these mental states (44).

Depression in nurses has been examined in a limited number of provinces of Iran. This indicates that there was a lack of valuable information for a detailed survey, and this gap can be filled in with future research. The present study aimed to determine depression prevalence in Iranian nursing staff, which provides helpful information for policy-makers and managers in the health system of Iran. However, this article had some limitations as follows: (a): These studies were conducted in a small number of provinces in Iran, (b): There was publication bias in the studied articles. Furthermore, some of these studies lacked sufficient information for investigating depression, regarding the hospital environment. Therefore, it is recommended that cross-sectional studies be performed in other provinces of Iran, as well.

## Conclusion

Given the relative prevalence of depression in nurses and its grave consequences, health policymakers and managers need to address this problem by adopting appropriate solutions such as enhancing amenities, involving nurses in decision making, supporting, and teaching problem solving skills.

## Conflict of interests

The authors declared no conflict of interests.

## Authors' contributions

Isfahani P designed research; Corani Bahador R, Peirovy S, Afshari M and Samani S conducted research; Isfahani P analyzed data; and Isfahani P wrote the manuscript; Afshari M had primary responsibility for final content. All authors read and approved the final manuscript.

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