

## Review Article

# Job Stress among Iranian Nurses: A Meta-Analysis

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### ABSTRACT

**Background:** Job stress is one of the most important factors in reducing the organizational productivity. **Objective:** This meta-analysis aimed to determine the prevalence of job stress among nurses in Iran. **Methods:** All articles published on the prevalence of job stress among Iranian nurses from January 1, 2004, to April 31, 2020, were searched in six databases. The reference lists of the articles were also checked for additional relevant studies. Finally, 25 articles were analyzed through Comprehensive Meta-Analysis software. Heterogeneity of studies was checked using the  $I^2$  index,  $Q$ -test and the possibility of publication bias by the Egger test. Metaregression was performed to assess the variables suspected to affect the heterogeneity at a significance level of 0.05. The outcomes of the study were combined using the random-effects model. **Results:** The overall prevalence of job stress in Iranian nurses was 37.5% (95% confidence interval [CI]: 28.5, 47.4). The highest prevalence was 96.4% in Tehran city in 2016 (95% CI: 90.3, 98.7), and the lowest prevalence was 2% in Kashan city in 2011 (95% CI: 0.7, 5.3). A significant correlation was observed between the prevalence of job stress and year ( $P = 0.0001$ ), mean age ( $P = 0.002$ ), and sample size ( $P < 0.0001$ ). **Conclusion:** Job stress affects over a third of Iranian nurses. Health-care policy-makers and managers should decrease this stress by adopting appropriate strategies such as increasing welfare facilities, reconsidering job descriptions for different levels of nursing, providing support, increasing nurses' involvement in the decision-making process, improving communication between managers and nurses, and teaching problem-solving skills to them.

**KEYWORDS:** Hospital, Job stress, Meta-analysis, Nurse, Prevalence

## INTRODUCTION

Stress is linked to many diseases<sup>[1]</sup> and is an important reason for absenteeism in health-care organizations.<sup>[2]</sup> Occupational stress is defined as the harmful physical and emotional responses that occur when requirements of a job do not match the capabilities, resources, and needs of the worker.<sup>[3]</sup> It occurs when expectations of workers exceed their authority and abilities and leads to personal problems, inability to work, and disruptions

in organizational performance.<sup>[4]</sup> Occupational stress, by increasing work-related incidents, delays, and absences,

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not only reduces workers' productivity, organizational commitment, and the quality of care but also predisposes them to hypertension and cardiovascular diseases.<sup>[5,6]</sup>

Nursing is one of the most stressful professions and its multitude of stressors negatively affects the staff. It is very demanding and practitioners experience many ups and downs from the time they begin their studies until they retire. Working long shifts and mandatory or voluntary overtime are some of the factors that affect nurses' job satisfaction.<sup>[7,8]</sup>

In Iran, 80% of health system workers are nurses. Besides, 80% of the works in hospitals is done by them.<sup>[9]</sup> The American National Institute of Health ranked nursing as the 27<sup>th</sup> among 130 most stressful jobs due to its effects on mental health. Like patients, nurses may experience stressors that they cannot adapt to.<sup>[10]</sup> Such stresses can impact on their performance in all aspects.<sup>[11]</sup> Studies have shown the prevalence of job stress in nurses is higher than that of the whole population, although it may vary among different countries as well as nursing specialties.<sup>[12]</sup> For example, in the US, 20% of intensive care units (ICUs) and general care nurses in various hospitals were found to suffering from anxiety and stress.<sup>[13]</sup> In Singapore, a survey showed 28% of nurses in a general hospital had anxiety disorders.<sup>[14]</sup> However, a study reported that 69% of Iranian nurses suffer from job stress.<sup>[15]</sup>

The high prevalence of job stress is not unexpected due to the nature of nurses' jobs. Conflict with physicians, colleagues and supervisors, inadequate emotional preparation, discrimination, high workload, concern about treatment, dealing with patients' death, and interactions with patients and their families are the main sources of job stress for nurses.<sup>[16]</sup>

In recent years, several studies have been published on the prevalence of job stress among Iranian nurses;<sup>[17-19]</sup> however, these studies have not been managed to provide a full picture of this crucial problem. Reviewing and integrating the results of published studies can help hospital managers and policy-makers make evidence-based decisions to manage job stress in nurses.

## Objectives

This meta-analysis aimed to estimate the prevalence of job stress among Iranian nurses.

## METHODS

This research was a meta-analysis of studies on the prevalence of job stress among nurses in Iran. It followed the Preferred Reporting Items for Systematic Review and Meta-Analysis guideline.<sup>[20]</sup>

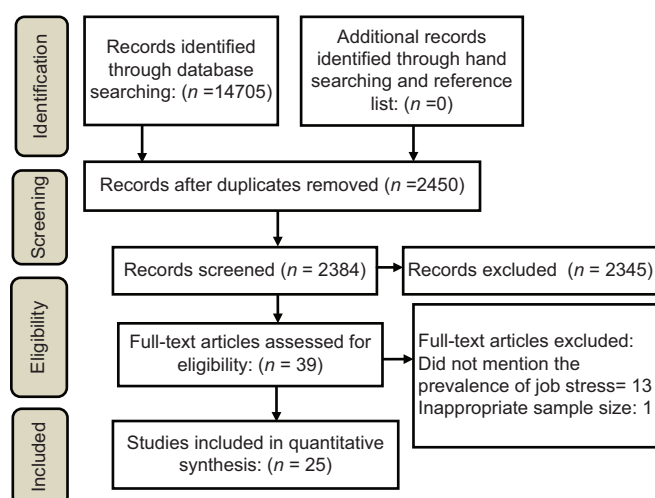
## Search strategy

Six electronic databases of PubMed (MEDLINE), Web of Science, Scopus, Magiran, Scientific Information Databases, and Google Scholar were systematically searched to identify relevant articles published between January 1, 2004, and April 31, 2020. Search keywords included job stress, occupational stress, job-related stress, work-related stress, workplace stress, nurses, hospital, Iran, and Iranian along with AND/OR boolean operators [Table 1]. The bibliographies of the identified articles were reviewed to find potentially useful sources.

The initial search resulted in 14,705 articles. After excluding duplicates and irrelevant articles, 12,255 studies remained for abstract examination. By reviewing the abstracts, 2345 articles were removed because of the article type (i.e., qualitative studies), studying the nurses from other countries, or the causes of job stress. Furthermore, 14 articles were removed after examining the full texts as they did not report the prevalence of job stress or had not an appropriate sample size. Finally, 25 studies were eligible for inclusion in this meta-analysis [Figure 1].

## Inclusion and exclusion criteria

Only cross-sectional studies on the prevalence of job stress in Iranian nurses that had been published until April 31, 2020, in the Persian or English languages were included. Studies in a language other than Persian or English, published after April 31, 2020, investigating the prevalence of job stress in only one ward of a hospital, reviews, books and dissertations, studies that did not report the prevalence of job stress in Iranian nurses, and qualitative studies were excluded.



**Figure 1:** Flowchart of selecting and reviewing the articles based on PRISMA statement

## Quality evaluation

The quality of the 25 included articles was assessed by using the 15-point scale developed by Mitton *et al.*<sup>[21]</sup> which assesses the quality of documents in five areas of literature review and identification of research gaps, research questions and design, population and sampling, data collection and capture, and analysis and results reporting. All items were scored on a four-point Likert scale, including 0 (not present/not reported), 1 (present but low quality), 2 (present and midrange quality), or 3 (present and high quality). Each article was rated independently by two researchers, and their disagreements were resolved through discussion or by consulting a third reviewer, if necessary. Finally, studies with moderate and high-quality were included in the meta-analysis.

The following data were extracted from each article and entered into an Excel spreadsheet: the title, the name of the first author, the year of publication, location of the study, sample size, methodology, mean age and work experience of the participants, and the rate of job stress among them.

## Data analysis

Data were analyzed using the Comprehensive Meta-Analysis software (Version 2.2.064, the US, Biostat company). The  $I^2$  and  $Q$ -tests were used to examine the heterogeneity of the studies. The heterogeneity was divided into three categories of <25% (low heterogeneity), 25%–75% (moderate heterogeneity), and >75% (high heterogeneity). As the heterogeneity was high ( $I^2 = 97.07$ ) a random-effect model was used to synthesize the results.<sup>[22]</sup> The funnel plot and Egger's test were used to assess the potential for the publication bias,<sup>[23]</sup> and the results showed that publication bias was not statistically significant ( $P = 0.43$ ). Finally,

the effect of variables that could be the potential sources of heterogeneity was examined using the metaregression technique. Point estimation of job stress prevalence in nurses was calculated in forest plots at 95% confidence interval (CI), where the size of the box indicates the weight of each study and the lines on its sides represent the 95% CI.

## RESULTS

In total, 25 articles were reviewed in this meta-analysis [Table 2]. All of the studies had a cross-sectional design ( $n = 25$ , 100%) and a majority of them were conducted in 2017 (4 articles), 2016 and 2012 (3 articles) [Figure 2]. More than half of the studies were published after 2010.

Most studies were done in educational hospitals in Esfahan, Tehran, Sistan and Baluchestan, and Hamedan provinces [Figure 3].

Based on the random-effects model, the overall prevalence rate of job stress was 37.5% (95% CI: [28.5, 47.4]). The lowest prevalence was reported in Kashan city in 2012 at 2% (95% CI: [0.7, 5.3]), while the highest prevalence was observed in Tehran city in 2016 at 96.4% (95% CI: [90.3, 98.7]) [Figure 4].

The results were summarized by the sample size, geographic region, instruments used, and quality of

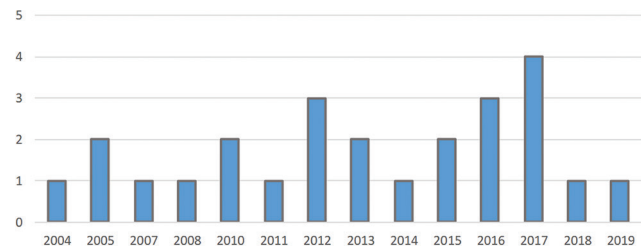


Figure 2: Frequency distribution of studied years

Table 1: Search strategy in different databases

Databases	Search strategy	Preliminary searches
PubMed	(((((“job stress”[All Fields] OR “occupational stress”[All Fields]) OR “job related stress”[All Fields]) AND “work related stress”[All Fields]) AND (“nurses”[MeSH Terms] OR “nurses”[All Fields] OR “nurse”[All Fields])) AND (“hospitals”[MeSH Terms] OR “hospitals”[All Fields] OR “hospital”[All Fields])) AND (“iran”[MeSH Terms] OR “iran”[All Fields]) AND (all[sb] AND (“0001/01/01”[PubDate] : “2020/04/31”[PubDate]))	134
Scopus	TITLE-ABS-KEY ( “job stress” OR “occupational stress” OR “work related stress” OR “workplace stress” ) AND ALL ( nurse ) AND ALL ( iran ) AND ( LIMIT-TO ( ACESSTYPE ( OA ) ) ) AND ( LIMIT-TO ( DOCTYPE , “ar” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) OR LIMIT-TO ( LANGUAGE , “Persian” ) )	110
Web of science	(TS=(“job stress” OR “occupational stress” OR “work related stress” OR “workplace stress”) AND ALL=nurse AND ALL=hospital AND ALL=Iran) AND LANGUAGE: (English OR Persian) AND DOCUMENT TYPES: (Article)	65
Magiran	Job stress, nurses, hospital, Iran	86
SID	Job stress, nurses, hospital, Iran	10
Google scholar	Job stress, occupational stress, work related stress, workplace stress, nurse, Iran	14,300

SID: Scientific Information Databases

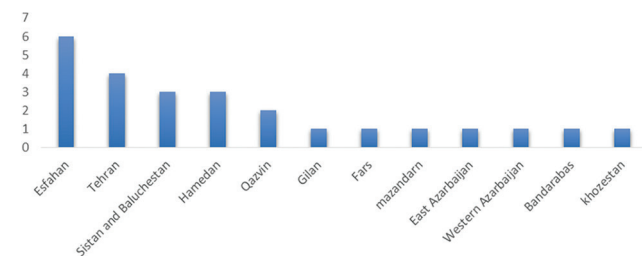
Table 2: Characteristics of the included studies

Author	Instrument used	Year	Sample size	Prevalence	Type of sampling	Study design	Ward type	City	Work experience	Mean age	Quality score
Moallemi and Adroom <sup>[19]</sup>	Gray Taft Nursing Stress Scale	2016	103	75	Stratified sampling	Cross-sectional	All	Zahedan	-	33.68	11
Rahimi <i>et al.</i> <sup>[24]</sup>	-	2004	111	98.2	Random sampling	Cross-sectional	All	Tehran	-	-	11
Mohebbifar <i>et al.</i> <sup>[25]</sup>	Harris questionnaire	2015	112	95.4	Census sampling	Cross-sectional	All	Qazvin	8.66	31.88	13
Komeili-Sani <i>et al.</i> <sup>[26]</sup>	Osipow	2015	80	35.1	Random sampling	Cross-sectional	All	Ahvaz	5.94	28.6	13
Hossini <sup>[27]</sup>	Steinmetz	2012	101	16.9	Cluster sampling	Other	All	Bandar Abbas	-	-	10
Karimyar Jahromi <sup>[28]</sup>	Cohen's Perceived Stress Scale	2014	212	76.4	Census sampling	Cross-sectional	All	Jahrom	-	26.72	11
Mehrabi <i>et al.</i> <sup>[29]</sup>	Gray Taft Nursing Stress Scale	2007	170	83.5	Random sampling	Cross-sectional	All	Esfahan	-	-	10
Hazavehei <i>et al.</i> <sup>[30]</sup>	Gray Taft Nursing Stress Scale	2012	237	57.4	Stratified sampling	Cross-sectional	All	Hamedan	-	-	10
Bahrani <i>et al.</i> <sup>[31]</sup>	Osipow	2011	190	4.7	-	Cross-sectional	All	Kashan	6.7	29.8	12
Noorian <i>et al.</i> <sup>[32]</sup>	Gray Taft Nursing Stress Scale	2010	170	83.5	Stratified sampling	Cross-sectional	All	Esfahan	-	34	11
Vahed <i>et al.</i> <sup>[33]</sup>	Alzheimer	2010	150	97.4	Census sampling	Cross-sectional	All	Zabol	-	-	10
Sherbafnezhad <i>et al.</i> <sup>[34]</sup>	Gray Taft Nursing Stress Scale	2008	240	97	Random Sampling	Cross-sectional	All	Tabriz	8.05	31.8	11
Khalilzadeh <i>et al.</i> <sup>[35]</sup>	Nursing Stress Scale	2005	200	92	Random sampling	Cross-sectional	All	Urmia	-	-	10
Khodaveisi <i>et al.</i> <sup>[36]</sup>	Hinshaw and Atwood	2005	310	92	Census sampling	Cross-sectional	All	Hamedan	-	-	11
Khammar <i>et al.</i> <sup>[37]</sup>	Cooper's questionnaire	2016	100	96.4	Random sampling	Cross-sectional	All	Tehran	11.52	35	13
Poursadeghiyan <i>et al.</i> <sup>[38]</sup>	Osipow	2017	350	65	Random sampling	Cross-sectional	All	Tehran	-	38.4	12
Poursadeghiyan <i>et al.</i> <sup>[39]</sup>	Osipow	2016	250	51.6	Random sampling	Cross-sectional	All	Tehran	-	36.4	11
Javadi-Pashaki and Darvishpour <sup>[40]</sup>	Hospital Job Stress Questionnaire	2019	318	97.4	Multistage cluster sampling	Cross-sectional	All	Gilan	-	-	11
Asefzadeh <i>et al.</i> <sup>[41]</sup>	Steinmetz Standard Job Stress Questionnaire	2017	350	39.7	Multistage stratified sampling	Cross-sectional	All	Mazandaran	-	34.78	12
Mosadeghbrah <sup>[42]</sup>	A researcher-made questionnaire	2013	296	34.9	Random sampling	Cross-sectional	All	Isfahan	10	34	14
Najimi <i>et al.</i> <sup>[43]</sup>	Occupational Stress Inventory-Revised	2012	189	3.7	Random sampling	Cross-sectional	All	Kashan	-	29.8	10
Karimi <i>et al.</i> <sup>[44]</sup>	A researcher-made questionnaire	2018	209	57.7	Quota sampling	Cross-sectional	All	Isfahan	8.05	31.8	13
Hosseini <i>et al.</i> <sup>[45]</sup>	Gray Taft Nursing Stress Scale	2013	237	557.4	Random sampling	Cross-sectional	All	Hamedan	-	-	11
Gorgich <i>et al.</i> <sup>[46]</sup>	Osipow	2017	124	98.4	Random sampling	Cross-sectional	All	Zahedan	9.34	31.39	12
Dehghankar <i>et al.</i> <sup>[47]</sup>	Gray Taft Nursing Stress Scale	2017	123	68.37	Stratified random sampling	Cross-sectional	All	Qazvin	-	32.36	12



the studies [Table 3]. Job stress was more prevalent among nurses working in the southern region of Iran. Furthermore, studies with a sample size smaller than 150, and studies with higher quality reported higher prevalence rates. The Gray-Taft nursing stress scale and Osipow's Job Stress scale were the most used scales and were used in seven and six studies, respectively. The rate of job stress was higher in studies that have used the Gray-Taft nursing stress scale.

A high level of heterogeneity was found among the studies ( $Q = 819.341$ ;  $P = 0.0001$ ). Thus, the variables (year, sample size, and age average) were entered into the meta-regression model to identify those that potentially caused heterogeneity. Table 4 and Figures 5 indicate that the sample size, year, and the nurses' mean age contributed to the heterogeneity



**Figure 3:** Frequency distribution of studied provinces

**Table 3: Subgroup analyses of the included studies**

Variable	Number of studies	Prevalence 95% CI	$P$	$P$
Sample size				
≤150	9	70.8 (54.4–83.1)	95.23	≤0.001
>150	16	22.6 (16.9–29.6)	95.34	≤0.001
Geographic region				
Center	13	35.2 (21.1–52.5)	97.65	≤0.001
South	6	52.3 (33.2–70.7)	95.90	≤0.001
North	4	29.9 (17.1–46.9)	96.47	≤0.001
West	2	27.1 (22.1–32.8)	50.24	≤0.001
Articles quality				
High	5	56.6 (24.2–84.2)	98.05	≤0.001
Moderate	20	33.7 (24.9–43.7)	96.89	≤0.001
Study tool				
Gray taft nursing stress scale	7	44.3 (32.5–56.8)	94.51	≤0.001
Osipow	5	23.4 (7.6–53.2)	97.96	≤0.001
Other	12	34.8 (22.8–49.2)	97.15	≤0.001

CI: Confidence interval

**Table 4: Results of meta-regression**

Variable	Articles number	Coefficient	$P$
Year	25	−0.04	0.0001
Sample size	25	−0.008	0.0001
Age average	16	−0.006	0.002

of studies in the prevalence of job stress. The results revealed that the prevalence of job stress among nurses has decreased by 0.04% each year. One year increase in nurses' age decreased the prevalence of job stress by 0.006. Moreover, the results showed that one unit increase in sample size has lead to a 0.008 decrease in the prevalence of job stress among Iranian nurses.

## DISCUSSION

Based on a random-effects model, the prevalence of job stress among Iranian nurses was found to be 37.5%. Several studies have also examined the prevalence of job stress among nurses worldwide and reported different rates. For example, the prevalence of job stress among nurses in Thailand<sup>[48]</sup> and Saudi Arabia<sup>[49]</sup> was 26.2% and 34.2%, respectively, which are consistent with our findings. However, this rate was 93% in Zambia.<sup>[50]</sup> It seems that job stress is an inevitable problem in health care professionals, although its level is different in different contexts.

In recent years, many studies have been conducted on job stress among Iranian nurses. However, the results of these studies showed large dispersion and heterogeneity. A large part of the variation might be attributed to the different instruments used. Although about half of the studies reviewed used the Gray Taft Nursing Stress Scale or Osipow questionnaire, however, the rest of the studies had used other scales. The large variation in the scales used makes it hard to compare the results of the studies. Developing a job stress scale that is compatible with the conditions of Iran's hospitals would help future researchers to have a more reliable estimate of the prevalence of job stress among Iranian nurses. Nonetheless, the difference in the prevalence rates of job stress among nurses in different studies might also be attributable to the methods of rating, sample sizes, and the differences in the work settings and organizational climate.

Although some degrees of job stress is inevitable, however, high levels of it can decrease in performance of health care professionals, including nurses. A few earlier meta-analyses have also highlighted the prevalence of job stress among Iranian nurses.<sup>[15,51]</sup> These reviewspaid attention to different aspects of the prevalence of job stress among nurses. For example, Ghanei Gheshlagh *et al.* published two systematic reviews. In the first article, they reviwed 11 articles and calculated the mean nurses' job stress score as 96.56.<sup>[15]</sup> In the second paper, the prevalence of occupational stress in nurses was examined and has reported to be about 89%.<sup>[51]</sup> However, the studies reviewed in these articles were not homogeneous and some of them had focused only on

Meta Analysis

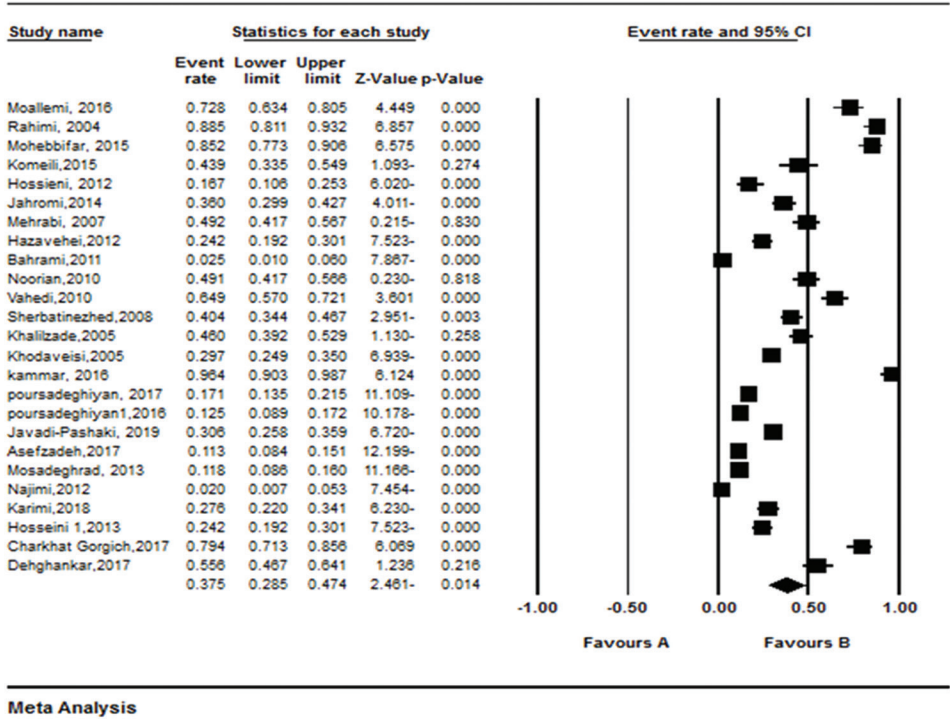


Figure 4: Forest plot of the included studies

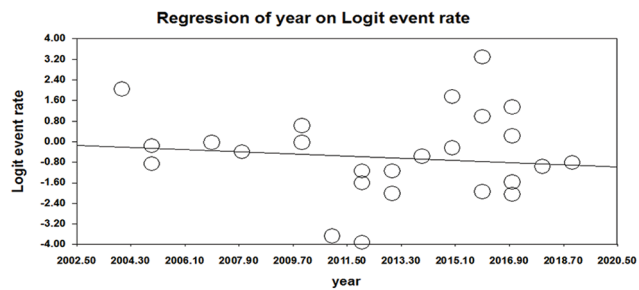


Figure 5: Results of the meta-regression analyses

nurses working in one ward such as emergency, ICU, or operation rooms. However, in the present study, the prevalence of job stress in all wards of a hospital has been considered.

This study showed that job stress is more prevalent among nurses working in the southern regions of Iran. Organizational factors and factors related to the work setting may be one of the reasons for this finding. Work settings that are unable to fulfill nurses' needs can negatively affect their mental health and induce them anxiety, stress, and job-related injuries. Today's healthcare organizations have a special focus on profit-making and pay less attention to the human aspect of the work.<sup>[52]</sup> Such a condition would increase the level of job stress and job satisfaction among health-care workers, especially nurses. However,

understanding factors affecting job stress help nurse managers and hospital authorities to plan strategies for the improvement of nurses' psychosocial well-being, organizational effectiveness, and patient safety and health.

In this research, the prevalence of nursing job stress was shown to decrease by 0.008% for each unit increase in the sample size. This indicates that studies with smaller sample sizes might overestimate the prevalence of job stress. Therefore, studies on the prevalence of job stress among nurses must enjoy adequate sample size and the use of appropriate sampling methods.

The results indicated that the prevalence of job stress among nurses has decreased by 0.04% each year. Perhaps, this indicates that the actions taken in recent years such as accreditation, health system transformation plan implementation, could be somewhat effective in reducing job stress.

The results showed that every year of increase in nurses' age decreases the prevalence of job stress by 0.006%. This finding is consistent with the findings of Khodaveisi *et al.*<sup>[36]</sup> and might be attributed to the increased work experience and job compatibility of nurses with higher ages.

The present study used meta-analysis to determine the prevalence of job stress among Iranian nurses and

provided useful information for policy-makers and administrators in Iran's health sector. However, this study also has some limitations as follows: (a) a wide variety of tools used for collecting data; (b) these studies carried out in a small number of cities in Iran, and (c) there was the lack of valuable information for a detailed survey. Further, countrywide and multicenter studies on the prevalence of job stress among Iranian nurses can provide precise and more reliable results.

## CONCLUSIONS

According to the results of this study, Job stress affects more than a third of the nursing staff in Iran. Therefore, it is important for health-care managers and policy-makers in Iran to identify the causes of the job stress, to reduce it, and develop cost-effective strategies to alleviate it. Health-care managers and policy-makers must prevent this by adopting appropriate strategies such as increasing welfare facilities, reconsidering job descriptions for different nursing levels, providing support, increasing nurses' involvement in the decision-making process, improving communication between managers and nurses, and teaching problem-solving skills to them.

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## Conflicts of interest

There are no conflicts of interest.

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