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PREVALENCE OF OCCUPATIONAL STRESS AMONG IRANIAN PHYSICIANS AND DENTISTS: A SYSTEMATIC AND META-ANALYSIS STUDY

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ABSTRACT

BACKGROUND. Occupational stress in health care providers is an undesirable factor that can lead to dissatisfaction and burnout and affect the quality of care and treatment of patients. This study estimated the prevalence of occupational stress among Iranian physicians and dentists.

METHODS. The articles were searched using the keywords: “job stress”, “job-related stress”, “occupational stress”, “work-related stress”, “workplace stress”, “physician”, “dentist”, and “Iran”, and all possible combinations of these terms in domestic databases of Scientific Information Database (SID) and MagIran and international databases of Web of Science, PubMed, and Scopus with no time limit. Heterogeneity among the studies was assessed using the Cochran’s Q test. Data analysis was performed in Stata version 11 based on the heterogeneity state using a random-effects model.

RESULTS. The sample size in selected articles on physicians and dentists varied from 71 to 516 and 90 to 200, respectively. The prevalence of occupational stress in physicians was 70.10% (95% CI: 55.43-84.78), and among dentists was 50.87% (95% CI: 33.93-67.81). According to the results, there was no significant association between the prevalence of occupational stress, sample size, and year of publication in physicians and dentists. The results showed that publication bias was ($p=0.029$) for physicians and ($p=0.630$) for dentists.

CONCLUSIONS. Occupational stress among Iranian physicians and dentists is high, which can adversely affect therapists and patients. Therefore, it is necessary to focus on this problem to manage and control it.

Keywords: *occupational stress, physician, dentist, prevalence*

INTRODUCTION

Stress is a nonspecific response that is affected by various stresses in the organism and threatens the individual’s physical and psychological well-being (1). Any stimulus that causes stress in humans is known as a stressor; everyone encounters a variety of stressors throughout their lives, and among them, occupational stress is of particular importance (2, 3). Occupational stress occurs when there is no coordination between the needs of the job, abilities, and desires of the individual (4).

30% of the workforce in developed countries suffers from occupational stress, which is also higher in developing countries (5). The United Nations called work stress the 20th Century Disease in 2011, and the World Health Organization declared it an epidemic worldwide (6, 7). Occupational stress has various health effects and complications, such as cardiovascular, gastrointestinal, musculoskeletal, and immune system disorders, and raises the risk of injury during work (8). The psychological complications of occupational stress cover various diseases, from mild nervous symptoms to severe mental illnesses (9). Early and mild symptoms of occupational stress may include loss of appetite, insomnia, headache, indigestion, nail

biting, and decreased concentration. Symptoms such as depression, anxiety disorders, and psychological pains may also occur (10). Occupational stress may also lead to absenteeism, a tendency to drink alcohol, drug addiction, and sleep disorders (11).

Dental and medical professions are stressful occupations that can affect the health of doctors and their patients (12, 13). Factors such as high workload, exposure to critical patients, feelings of responsibility for the death of patients, and night shifts impose considerable a lot of stress on physicians. Stress can affect physicians' function and lead to patient injury (14-16). Dentists are also exposed to a lot of stressful resources that have a negative impact on their lives and jobs.

The results of various studies have shown that occupational stress in dentists is related to job dissatisfaction, fatigue, early retirement, job change, physical illness (such as high blood pressure, coronary artery disease, headache, back pain, and digestive problems), decreased life expectancy, and suicide (12, 14, 17-19). According to Zamanian et al. (2016), the prevalence of occupational stress among dentists is more than three times that of other people (20). Various studies have shown that the prevalence of occupational stress among physicians and dentists varies from 38% to 85% (21, 22) and 11% to 79.3%, respectively (23, 24). Given that the first step in identifying any problem is to know the current situation, this study evaluates the prevalence of occupational stress among Iranian doctors and dentists.

MATERIAL AND METHODS

In this systematic and meta-analytic review, the prevalence of occupational stress was studied in Iranian doctors and dentists based on preferred reporting items for systematic review and meta-analysis (PRISMA) (25).

Search strategy. This study investigated the prevalence of occupational stress among Iranian physicians and dentists without a time limit. Scientific Information Database (SID), MagIran, Web of Science, PubMed, and Scopus were used to search for articles. Search for articles was done using the keywords "job stress", "job-related stress", "occupational stress", "work-related stress", "workplace stress", "physician", "dentist" and "Iran" and their combination. We searched backward (i.e., reviewing the reference lists of eligible articles) and forward (i.e., reviewing papers that were cited in eligible studies) to access more articles. Further details are provided in Table 1.

Study selection and data extraction. At first, all articles in which the prevalence of occupational stress was noted among physicians and dentists were collected by two independent researchers. The inclusion criteria were observational studies, publication in Persian or English, and access to the full text of the articles. Non-related studies, gray literature, interventional studies, review studies, and duplicated studies were excluded. To minimize bias, two researchers searched for articles, selected studies, evaluated the methodological quality, and extracted

Table 1. Search strategy in international databases.

PubMed	("Occupational Stress"(Mesh) OR "Occupational Stress*" (tiab) OR "Job Stress*" (tiab) OR "Work related Stress*" (tiab) OR "Workplace Stress*" (tiab) OR "Work place Stress*" (tiab) OR "Professional Stress*" (tiab) OR "Job-related Stress*" (tiab)) AND ("Physicians"(Mesh) OR "Physician*" (tiab)) AND iran* (all)	("Occupational Stress"(Mesh) OR "Occupational Stress*" (tiab) OR "Job Stress*" (tiab) OR "Work related Stress*" (tiab) OR "Workplace Stress*" (tiab) OR "Work place Stress*" (tiab) OR "Professional Stress*" (tiab) OR "Job-related Stress*" (tiab)) AND ("Dentists"(Mesh) OR "Dentist*" (tiab) OR " Prosthodontist*" (tiab) OR " Periodontist*" (tiab)) AND iran* (all)
Scopus	TITLE-ABS-KEY ("Occupational Stress*" OR "Job Stress*" OR " Work related Stress*" OR "Workplace Stress*" OR "Work place Stress*" OR "Professional Stress*" OR "Job-related Stress*") AND TITLE-ABS-KEY ("Physician*") AND ALL (iran*)	TITLE-ABS-KEY ("Occupational Stress*" OR "Job Stress*" OR " Work related Stress*" OR "Workplace Stress*" OR "Work place Stress*" OR "Professional Stress*" OR "Job-related Stress*") AND TITLE-ABS-KEY ("Dentist*" OR " Prosthodontist*" OR " Periodontist*") AND ALL (iran*)
Web of Science	TS= ("Occupational Stress*" OR "Job Stress*" OR " Work related Stress*" OR "Workplace Stress*" OR "Work place Stress*" OR "Professional Stress*" OR "Job-related Stress*") AND TS=("Physician*") AND ALL=(iran*) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.	TS= ("Occupational Stress*" OR "Job Stress*" OR " Work related Stress*" OR "Workplace Stress*" OR "Work place Stress*" OR "Professional Stress*" OR "Job-related Stress*") AND TS=("Dentist*" OR " Prosthodontist*" OR " Periodontist*") AND ALL=(iran*) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.

data independently. Any disagreement was resolved by discussion. A form was used to record the selected information, including the names of the first author, the year of publication, the place where the study was conducted, the total sample size, the language of the study, and the prevalence of occupational stress. The methodological quality of articles was reviewed based on the ten selected items from the Strengthening The Reporting of Observational Studies in Epidemiology (STROBE) checklist (title and abstract, goals and hypotheses, research setting, inclusion criteria, sample size, statistical methods, descriptive data, record the required, interpretation of findings, research limitations and research funding) (26).

Statistical analysis. This systematic review and meta-analysis calculated a point estimate and a 95% confidence interval for occupational stress according to the binomial distribution. The heterogeneity between the studies was evaluated by Cochran's Q test with a significant level of less than 0.1 and the I^2 index. The I^2 index of heterogeneity was classified into less than 25% (low heterogeneity), 25% to 75% (moderate heterogeneity), and more than 75% (high heterogeneity) (27). Considering the heterogeneity between selected studies, we estimated the pooled prevalence of stress using the random-effects model.

We also used univariate meta-regression to investigate the relationship between the occupational stress of doctors and dentists with the variables of the year of publication and sample size. Subgroup analysis was used to determine the pooled prevalence of occupational stress based on region and tool. A funnel plot based on Egger's regression test was used to investigate the effect of publication bias (28). Data analysis was performed using the Stata 11 software.

RESULTS

All articles about the occupational stress of Iranian physicians and dentists were systematically reviewed. In the initial search for national and international databases, 302 papers were found. In the screening and eligibility stage, 286 unrelated articles were excluded from the analysis; finally, eight papers on the occupational stresses of physicians and eight papers on the occupational stress of dentists were analyzed. Since national databases were not sensitive to Boolean operators, the keywords were searched in single words. The screening process of articles and the methodological quality of articles are shown in Figure 1 and Table 2, respectively. Also, all the included articles were methodologically at a reasonable level.

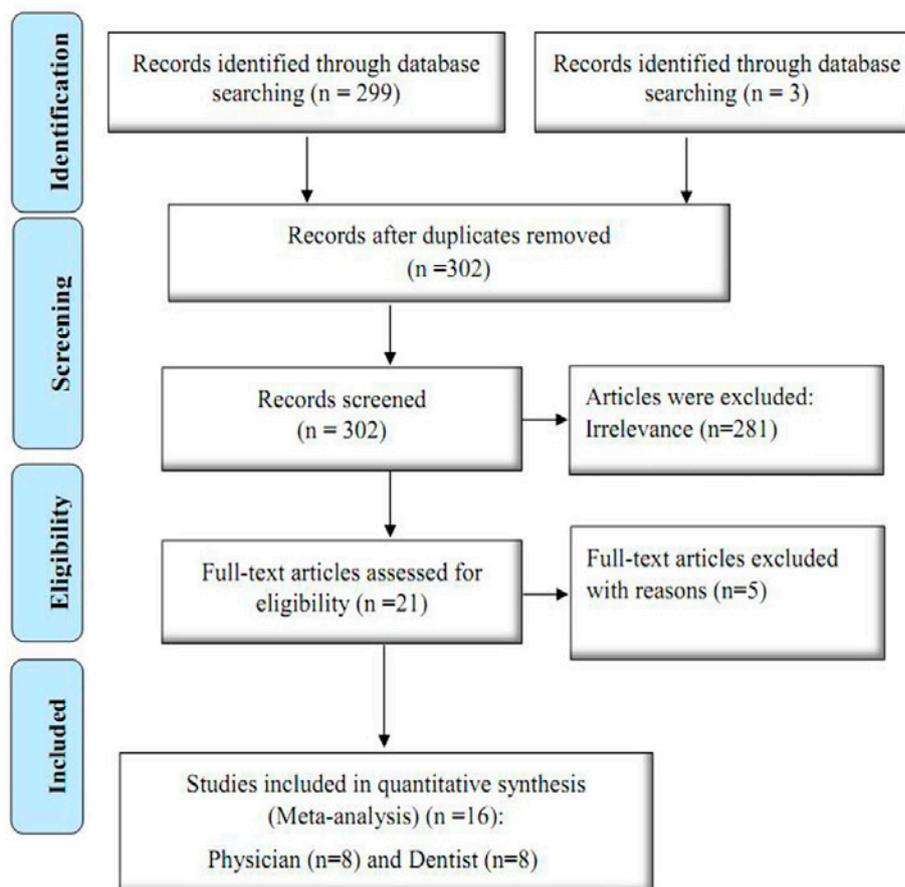


Fig. 1. Process of screening and selecting the studies based on the PRISMA statement

Table 2. Methodological quality of analyzed articles

First Author	Title & abstract	Objectives hypotheses	Research setting	Inclusion criteria	Sample size	Statistical methods	Descriptive data	Analysis of findings	Limitations	Funding	Total score
Ebrahimi (29)	+	+	+	+	+	+	+	+	+	+	10
Shahbazi (30)	+	+	+	+	+	+	+	+	+	+	10
Afkhamzadeh(6)	+	+	+	+	+	+	+	+	+	+	10
Kamali Ardakani (21)	+	-	+	+	+	+	+	+	+	-	8
Malek (12)	+	+	+	+	+	+	+	+	-	+	9
Ahadi (31)	+	-	+	+	+	+	+	+	+	-	8
Sharifian(32)	+	+	+	+	+	+	+	+	+	+	10
Bahreiniian (22)	+	-	+	+	+	-	+	+	+	-	7
Shirinbak (23)	+	+	+	+	+	+	+	+	-	-	8
Saatchi (33)	+	+	+	+	+	+	+	+	+	+	10
Nazari (24)	+	+	+	+	+	+	+	+	+	+	10
Zamanian (20)	+	+	+	+	+	+	+	+	+	+	10
Pouradeli (34)	+	+	+	+	+	+	+	+	+	+	10
Mirsaifi (35)	+	+	+	+	+	+	+	+	-	-	8
Amini (36)	+	+	+	+	+	+	+	+	+	+	10
Akbari (37)	+	+	+	+	+	+	+	+	+	-	9

In eight papers, occupational stress was studied on 2 241 physicians (an average of 280 doctors in each study), and in eight other articles, occupational stress was studied in 1 098 dentists (an average of 137 dentists in each study). The sample size in occupational stress-related articles on physicians and dentists varied from 71 to 516 and 90 to 200, respectively. The

characteristics of the analyzed articles are presented in Table 3.

A publication bias was used to investigate whether all occupational stress reports of physicians and dentists were included in this study. The results showed that publication bias was ($p=0.029$) for physicians and ($p=0.630$) for dentists (Figure 2). Publication bias

Table 3. Characteristics of the selected studies

First Author	Year	Sample Size	Scale	Place	Prevalence (%)	Target
Ebrahimi (29)	2018	350	Osipow	Shiraz	88.8	Physician
Shahbazi (30)	2018	350	Osipow	12 provinces	71.4	
Afkhamzadeh(6)	2017	71	Osipow	Sanandaj	80.3	
Kamali Ardakani (21)	2013	516	Osipow	Tehran	38	
Malek (12)	2011	350	Osipow	Tehran	45.7	
Ahadi (31)	2008	194	Kobassa	Tehran	72	
Sharifian(32)	2005	110	Osipow	Tehran	80	
Bahreiniian (22)	2005	300	Self-Research-made	Tehran	85	
Shirinbak (23)	2018	131	Occupational Stress	Zanjan	11	Dentist
Saatchi (33)	2017	90	Occupational Stress	Isfahan	73.3	
Nazari (24)	2016	111	Osipow	Lorestan	79.3	
Zamanian (20)	2016	150	ENSS	Shiraz	43.8	
Pouradeli (34)	2016	93	Occupational Stress	Kerman	58.9	
Mirsaifi (35)	2015	150	DES	Yazd	52.7	
Amini (36)	2014	200	DASS-21	Kerman	36.9	
Akbari (37)	2011	173	DASS-21	Mashhad	52	

occurs when the results of a study bias the decision to publish or distribute. In other words, studies that reported positive results have more chances of being published than studies with negative effects.

The pooled prevalence of occupational stress in physicians was 70.10% (95% CI: 55.43-84.78). Five studies in Tehran (region 1), one study in Shiraz, and one study in Sanandaj were conducted; one study was also conducted in 12 provinces of the country. The results of the subgroup analysis showed that the prevalence of occupational stress in physicians in region 1 of the country (78.73%; 95% CI: 66-91.46) was

higher than in other regions of the country (67.29%; CI: 48.20-86.38).

In six studies, the Osipow tool was used. In the other two studies, Kobassa and researcher tools were used in the other two studies. Also, the prevalence of occupational stress based on Osipow (64.09%; with 95% CI: 43.5-84.67) was less than the other two tools (80.24%; 95% CI: 67.73-92.76) (Figure 3).

The results also indicated that the prevalence of occupational stress among dentists was 50.87% (95% CI: 33.93-67.81). Four studies were conducted in region 5 (Kerman 2 studies, and each of Mashhad and Yazd

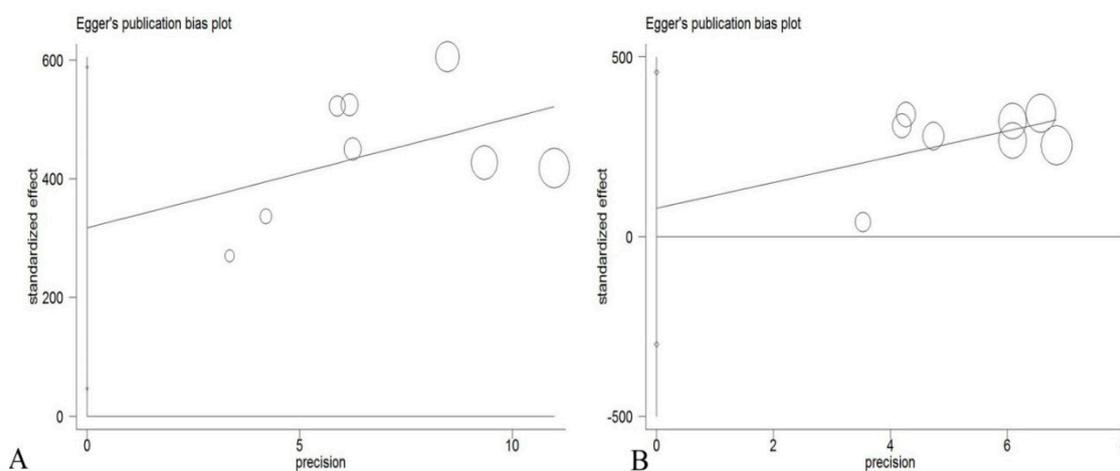


Fig. 2. Publication bias in estimating occupational stress in physicians (A) and dentists (B).

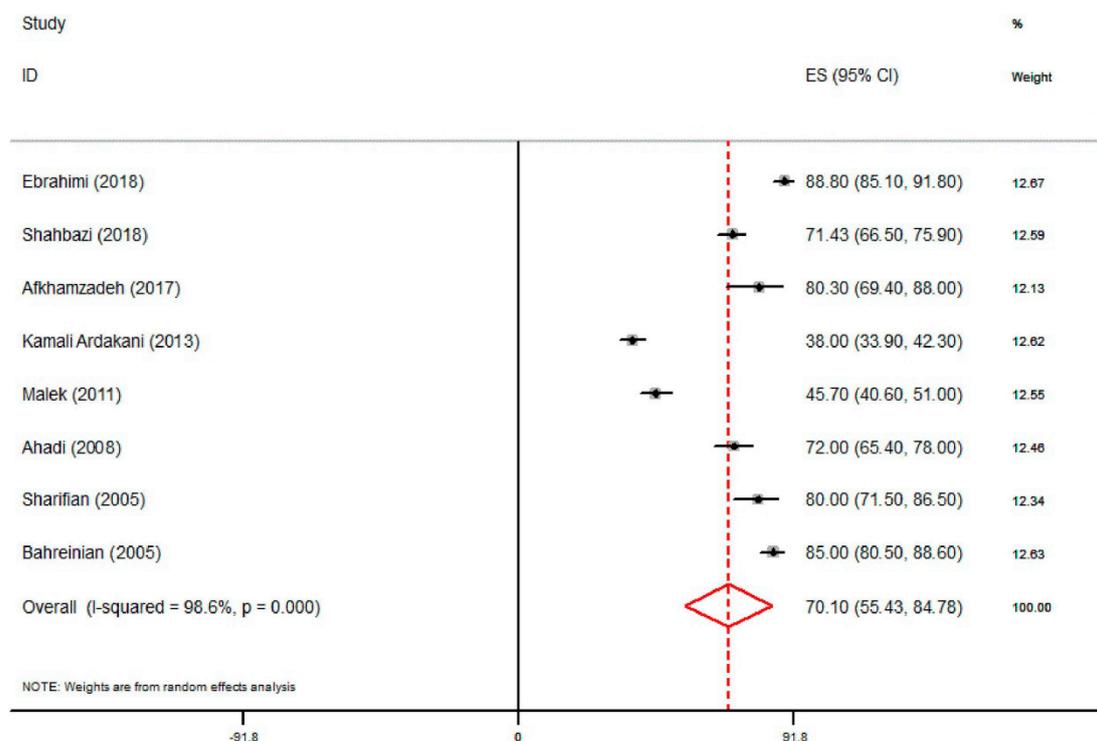


Fig. 3. Overall prevalence of occupational stress among Iranian physicians. The 95% confidence interval for each study is shown in the form of horizontal lines around the central mean, the midpoint of the dotted line represents the mean of the overall score, and the lozenge shape shows the confidence interval of the prevalence of the disorder.

provinces 1 study). Four other studies were conducted in other parts of the country (Zanjan, Isfahan, Lorestan, and Shiraz). The prevalence of occupational stress among dentists in region 5 of the country was 49.77% (95% CI: 40.21-59.33), and in other regions was 51.76%

(95% CI: 17.45-86.07). Three studies with occupational stress, two studies with DASS-21, one with Osipow, and one with DES tool, were done. The prevalence of occupational stress was 47.60% (95%CI: 5.68-89.53) with the occupational stress questionnaire, 44.36%

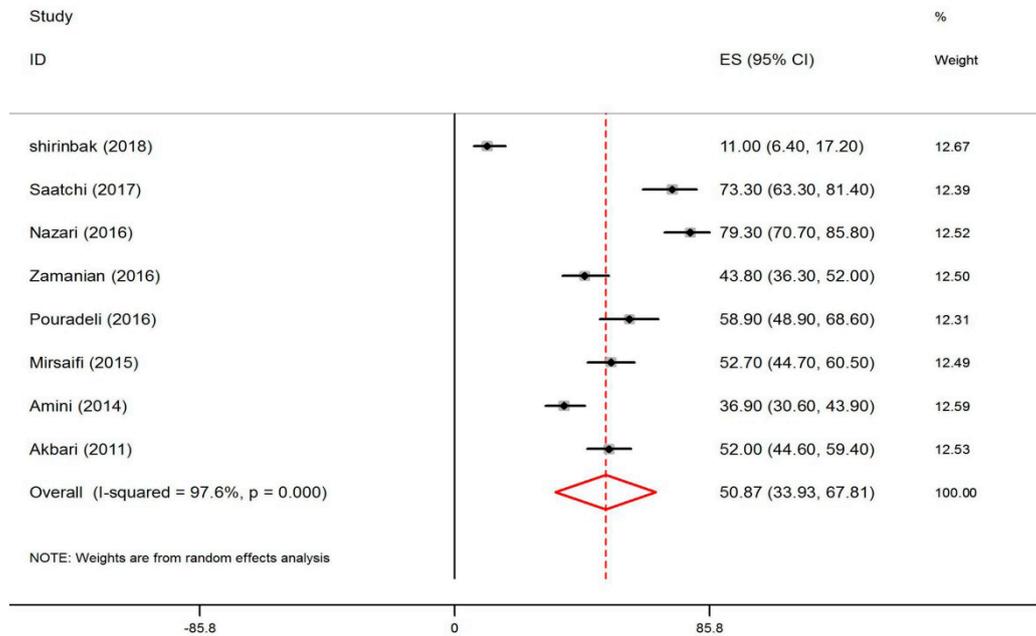


Fig. 4. Overall prevalence of occupational stress among Iranian dentists. The 95% confidence interval for each study is shown in the form of horizontal lines around the central mean, the midpoint of the dotted line represents the mean of the overall score, and the lozenge shape shows the confidence interval of the prevalence of the disorder.

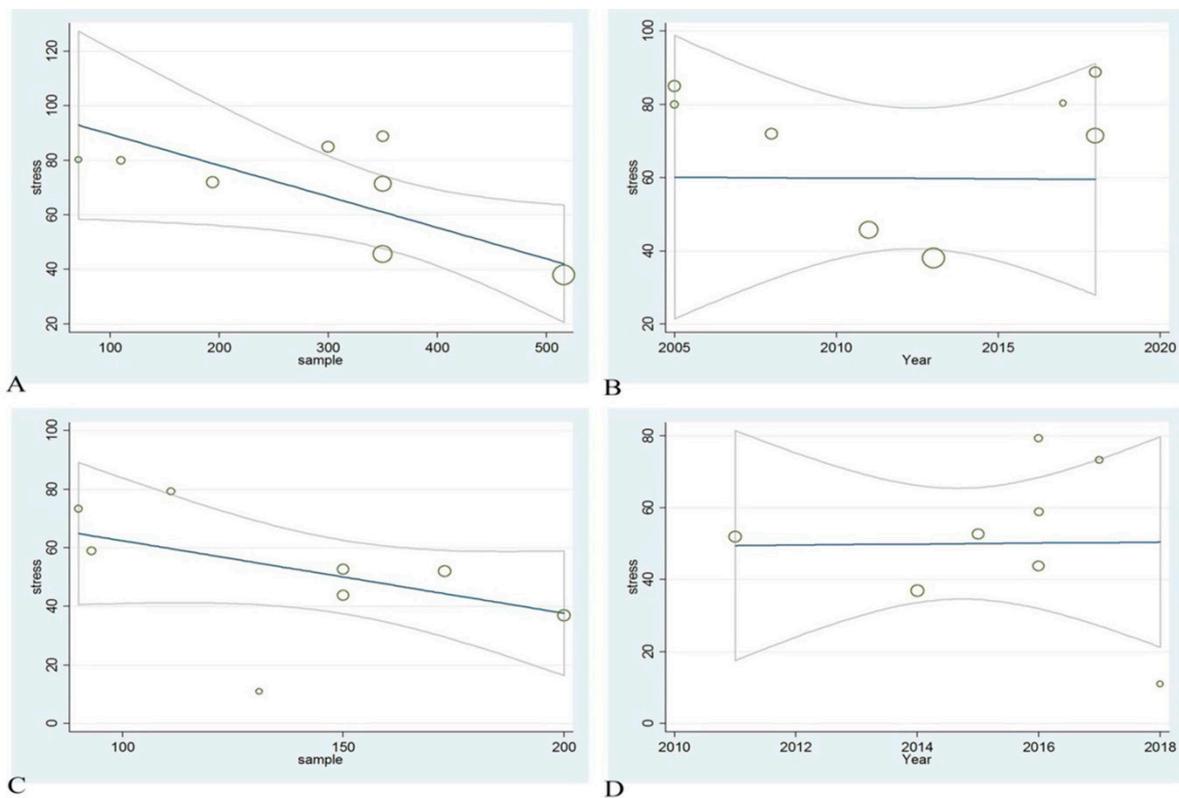


Fig. 5. The meta-regression of the prevalence of occupational stress in the physicians and dentists. The prevalence of occupational stress in physicians based on sample size (A) and year of publication (B), and in dentists based on sample size (C) and year of publication (D). Circles indicated the weight of the studies.

(95% CI: 29.56-59.16) with DASS-21 and 58.62% (95% CI: 37.45-79.80) with two other tools (Figure 4).

According to the meta-regression analysis, there was no significant relationship between the prevalence of occupational stress and sample size ($p=0.110$) and year of publication ($p=0.954$). Also, the prevalence of occupational stress in dentists was not related to the sample size ($p=0.223$) and year of publication ($p=0.789$) (Figure 5).

DISCUSSION

This systematic review and meta-analysis, aimed at estimating the prevalence of occupational stress in Iranian physicians, showed that occupational stress among physicians was 71%. In the study of Shanafelt et al. (2012), the level of occupational stress among American doctors was high (38). In the study of Rotenstein et al. (2018), the prevalence of occupational stress among doctors was 80.5% (39), which is consistent with the results of this study. Given the stressful nature of the medical profession, this finding is not far from the mind. However, in the study of Knesebeck et al. (2010), only 22% of medical assistants had occupational stress (40). In another study, 20% of Norwegian doctors had high-stress levels, which contradicted the current study's results (41). The difference in these results can be attributed to the differences in hospital facilities, hospital management style, and demographic characteristics of the samples in different studies. Stress is an integral part of the life of the medical staff, because it is necessary to respond to the needs of the patient and his family as soon as possible. Any mistakes can lead to excessive expenses or, in some cases, endanger the life of the patient, which may be irreparable (42-44).

The results of this study showed that the prevalence of occupational stress among Iranian dentists was 50.87%. Elani et al. (2014) reported high levels of occupational stress among dentists (45). Also, the results of a study by Morse et al. (2007) showed that stress among dentists was moderate (46), which is consistent with the results of this study. Stress is pervasive and is not specific to a particular profession (47). Due to the nature of clinical work, the work environment, and the focus on the small workspace of the oral cavity, dentists endure considerable tension, which leads to burnout and dissatisfaction (48, 49).

In Gorter et al., 10% of German dental practitioners had occupational stress. The authors considered the appropriate educational and therapeutic system, the annual assessment of dentists' skills, the provision of work permits to skilled dentists, and precise tariff regulations for lower stress in dentists (50).

The reason for the difference in results can be due to the cultural, social, and economic differences of the communities under study; therefore, since stress affects the efficiency of dentists and the satisfaction of patients, the observation of moderate and even low-stress levels is important and needs more attention. When the demand in the workplace exceeds one's abilities, occupational stress and burnout will emerge, which leads to many medical errors (51, 52). Findings show that occupational stress in physicians residing in Tehran was higher than in other parts of the country. This finding can be due to the referral of sick patients from other cities to Tehran, the high workload, and the lack of time.

The prevalence of occupational stress among dentists in region 5 was lower than in other parts of the country. The heterogeneous distribution of dentists in different regions of Iran, the imbalance in the labor market in other regions, and consequently, more clients and a more suitable labor market, suitable social status, and more job satisfaction can be attributed to this finding. The socioeconomic and cultural factors of the clients, the large number of dentists in large cities, and the low tariff for dental services also affect this finding.

Physicians' occupational stress based on Osipow's tool was lower than other tools, which could be due to differences in the leveling of subscale scores in different domains and their application in different environments with cultural diversity. On the other hand, this tool is designed in developed countries and tailored to the specific problems of the personnel of those countries (53). However, given the specific social and cultural characteristics of developing countries and eastern societies, as well as the unique characteristics of the behavior of the personnel of these countries, especially Iran, existing questionnaires may not cover all the specific problems of that society (54). The prevalence of occupational stress among dentists, according to Osipow and DASS-21, was lower than other tools, which can be due to the study being conducted in different places and times.

There was no relationship between the year of publication of papers and the physicians' and dentists' occupational stress. Over the years, there has been no coherent program to reduce the occupational stress of physicians, and international standards in hospitals are not respected. Therefore, it is necessary to investigate these conflicts and apply management and educational interventions in hospitals. As the number of selected articles was small, please note that the results of meta-regression and publication should be interpreted cautiously. We had a publication bias to estimate the prevalence of occupational stress among physicians. Therefore, all the studies that investigated occupational

stress in physicians were not included. The reason for that finding could be the studies' negative results and lack of publication. Another reason for the publication bias was that we did not include gray literature in the analysis because there is no special database in Iran that has a summary of all conferences, theses, and dissertations.

In this study, the prevalence of occupational stress among Iranian physicians and dentists has been systematically evaluated and estimated, which could be the strength of the current study. One of the limitations of the present study was the lack of adequate and accurate information in some studies.

CONCLUSION

The findings showed that the prevalence of occupational stress among Iranian physicians and dentists is high, which can have a negative effect on their professional performance and treatment process. Occupational stress can have physical and psychological consequences, so controlling and managing it is essential to preventing future problems. High occupational stress can also pose severe risks to patients referring to these physicians. The findings of this study provide a clear picture of occupational stress based on which health officials can take health and preventive measures. Also, identifying the factors affecting the occupational stress of doctors and dentists can be a helpful step in controlling and managing this problem.

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Conflict of interest.

None.

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