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Published Online: 2024 December 23 **Systematic Review**

Prevalence of Back and Neck Pain in Iranian Dentists: A Systematic Review and Meta-Analysis

Fahimeh Feili [1], Aminollah Vasigh [2], Mohamadali Roozegar [1,*]

[1] Oral and Dental Health Research Center, Ilam University of Medical Sciences, Ilam, Iran
[2] Department of Anesthesiology, School of Allied Medical Sciences, Ilam University of Medical Sciences, Ilam, Iran

[*] ***Corresponding Author:*** Oral and Dental Health Research Center, Ilam University of Medical Sciences, Ilam, Iran. Email: mohamadaliroozegar@gmail.com

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Abstract

Context: Musculoskeletal diseases (MSDs) and the pain caused by it are the main cause of loss of work ability, which causes people to leave their jobs and reduce their financial security.

Objectives: This meta-analysis study was conducted with the aim of determining the prevalence of back and neck pain in Iranian dentists.

Data Sources: This meta-analysis study was conducted based on the PARISMA checklist. All articles published in Farsi and English that were conducted in the group of dentists and were published between the years 2000 and 2024 were included in the study. Also, articles that were published in the group of students or assistants or had incomplete data were excluded from the study. Two of the authors of the article reviewed all the searched articles and extracted the related data. It should be noted that all the data were checked and confirmed by the third author of the articles. After entering the data into the researcher-made checklist, data analysis was performed using CMA software.

Results: Results showed, to begin with, 992 articles had been extracted, of which 46 had been removed in the preliminary search. Also, after extra reviews and evaluation of articles, forty-six articles were analyzed. Also, results showed, prevalence of neck pain in Iranian dentists was to 53.3 [CI = 48.5 - 57.9], prevalence of back pain it was to 45.2 [CI = 39.4 - 51.2], prevalence of upper back pain (UBP) in the last 12 months is equal to 39.5 [CI = 31.5 - 48.1] percent, and the prevalence of lower back pain (LBP) was equal to 34.4 [CI = 27.8 - 41.6] percent.

Conclusions: Considering the high prevalence of neck pain and back pain among dentists in Iran, it is necessary to take preventive measures to reduce neck and back pain among dentists.

Keywords: Back Pain, Neck Pain, Dentists

1. Context

Pain may be due to functional disorders or anatomical disorders. One of the causes of functional disorders is musculoskeletal disorders (MSDs) and injuries caused during work and activity. Musculoskeletal disorders are caused by physical activity that affects muscles, tendons, bones, and joints (1, 2). Musculoskeletal disorders differ in severity and include a wide range of disorders and complications, from mild to severe, chronic, and debilitating conditions (3).

Musculoskeletal diseases and the pain caused by it are the main cause of loss of work ability, which causes people to leave their jobs and reduce their financial security. So that the reduction of work ability, employment of a new employee, hospitalization of a person, and the need to perform diagnostic and treatment measures are among the economic pressures created on dentists. On the other hand, if there is Pain in dentists, it becomes difficult to provide proper service to patients, and as a result, satisfaction with dentists also decreases (4-6).

One of the medical professions that experience MSDs is dentists. The dental profession requires high concentration and accuracy for a long time and creates continuous and significant pressures on the body's organs (7). In fact, these complications are caused by the

long-term and continuous use of dental devices in a limited environment, performing delicate tasks, and being in unfavorable body positions for long hours, which lead to the experience of pain in dentists (8, 9). Dentists experience pain in most parts of the body, including pain related to the spine (10).

Having information about spine injuries and conducting necessary investigations in this field can be effective in preventing chronic diseases (11). The cervical spine has a structure that is responsible for supporting and orienting the head in space and transmitting the force arising from the trunk (4, 12, 13). As a result of injuries caused to the spine, neck and back, it suffers damage (13, 14).

Back pain and neck pain are among the pain experienced by dentists that are caused by MSDs (15, 16). Back pain is one of the common health problems across all ages, which is the main cause of disability and absenteeism from work. Lower back pain (LBP) is one of the main reasons for patients to visit doctors, reasons for hospitalization, patient referrals, and the use of physiotherapy services for patients (5, 17, 18). Chronic neck pain has a prevalence between 16.7% and 75.1% and is considered one of the common causes of disability. On the other hand, due to the increase in the elderly population in Iran, the prevalence of neck and back pain is expected to rise (19).

2. Objectives

Considering the significance of identifying pain in patients, this meta-analysis study was conducted with the aim of determining the prevalence of back and neck pain in Iranian dentists.

3. Data Sources

This meta-analysis study was conducted based on the PARISMA checklist (20).

3.1. Inclusion and Exclusion Criteria

All articles published in Farsi and English that were conducted in the group of dentists and were published between the years 2000 and 2024 were included in the study. Articles that were published in the group of students or assistants or had incomplete data were excluded from the study.

3.2. Information Sources and Study Selection

In this meta-analysis study, which aimed to determine the prevalence of back and neck pain among dentists in Iran, all articles in the international and domestic databases of Iran, including Scopus, PubMed, EBSCO, ISI, SID, Magiran, ScienceDirect, and Iranmedx, were reviewed. The search was performed using keywords such as LBP, back pain, neck pain, pain, dentists, Iran, upper back pain (UBP), and low back pain.

3.3. Data Collection and Statistical Analysis

Two of the authors of the article (associate professor of periodontology and assistant professor of restorative dentistry) reviewed all the searched articles and extracted the related data. It should be noted that all the data were checked and confirmed by the third author of the articles (FF). After entering the data into the researcher-made checklist, data analysis was performed using CMA software.

4. Results

Results showed that initially 992 articles were extracted, of which 46 were removed during the preliminary search (Figure 1). After additional reviews and evaluations, 46 articles were analyzed (Table 1).

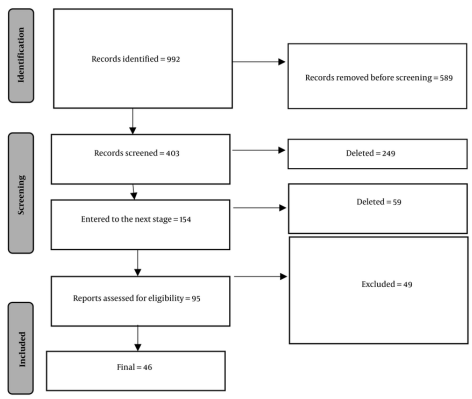

Figure 1. Articles included in the study

The results indicated that the prevalence of neck pain in Iranian dentists was 53.3% [CI = 48.5 - 57.9], the Prevalence of back pain was 45.2% [CI = 39.4 - 51.2], the prevalence of UBP in the last 12 months was 39.5% [CI = 31.5 - 48.1], and the prevalence of LBP was 34.4% [CI = 27.8 - 41.6] (Figures 2 - 9).

Table 1. Specifications of the Articles

Authors	Years	Place	Age	Questionnaire	N	Back	Upper Back	Lower Back	Neck
Pur Abbas et al. (21)	2004	Tabriz	-	VAS	97	12	-	-	42.2
Ezoddini et al. (22)	2005	Yazd	36.61 (9.57)	VAS	70	-	-	-	47.1
Nasl Saraji et al. (23)	2005	Birjand	36.70	NMQ & REBA	35	60	-	-	54
Sarami et al. (24)	2007	Tehran	36 (5.56)	NMQ & REBA	47	46.8	51.1	-	83
Kardani et al. (25)	2007	Ahvaz	-	Self-administered	172	-	-	-	70
Pargali and Jowkar (26)	2010	Shiraz	37.70 (7.65)	Self-administered	82	33	-	-	28
Ahmadi Motemayel et al. (27)	2012	Hamedan	39.02 (7.22)	NMQ	71	-	23.9	16.9	49.7
Chamani et al. (28)	2012	NMQ	38.2 (7.5)	Kerman	110	-	34	35	59
Choobineh et al. (29)	2012	Shiraz	39.01 (7.75)	NMQ	160	-	49.2	45.8	55.9
Rabiei et al. (30)	2012	Rasht	39.1 (8.73)	NMQ & RULA	92	35.8	-	-	43
Varmazyar et al. (31)	2012	Qazvin	28.38 (7.37)	NMQ & REBA	63	42.9	-	-	50.8
Aminian et al. (32)	2012	Tehran	35.75 (8.35)		210	-	51.3	55.5	66
Asgaripoor et al. (33)	2013	Semnan	38.40 (7.1)	NMQ & REBA	48	77.2	-	-	52.9
Eyvazi et al. (34)	2013	Tabriz	42.12 (8.99)	NMQ	100	38	-	-	48
Memarpour et al. (35)	2013	Shiraz	-	Painful disorders	272	-	30.7	29.9	31.8
Aminian et al. (36)	2013	Tehran	43.19 (9.88)	Nordic	261	54.8	-	-	-
Rahmani et al. (37)	2013	Tehran	41.30 (8.43)	VAS	300	-	-	-	34.7
Ebrahimian et al. (38)	2014	North-Khorasan	41.17	NMQ & REBA	60	46.7	-	-	27
Baroonizade et al. (39)	2014	Hamedan	28.74 (2.74)	NMQ & LUBA	30	43.3	-	-	63.3
Ilbeigi et al. (40)	2014	Mashhad	39.90 (9.7)	NMQ & RULA	80	50			56.3
Khayati et al. (41)	2014	Tehran	41.65 (6.23)	VAS	70	-	-	-	66.6
Shadmehr et al. (42)	2014	Tehran	-	Nordic	446	-	57	48.2	64.4
Rafie et al. (43)	2015	Kerman	-	NMQ	130	32.5	-	-	55.9
Nadri et al. (44)	2015	Tehran	38.2 (7.1)	VAS	150	-	-	34.5	50
Rahnamaye Tamrooiy et al. (45)	2015	Tehran	-	NMQ & RULA	92	55.4		--	78.3
Tirgar et al. (46)	2015	-	43.85 (6.64)	NMQ & RULA	60	-	40	-	83.3
Jalili Nasab et al. (47)	2016	Qazvin	38.8 (7.9)	Nordic	50	-	10	16	24
Seifi et al. (48)	2016	Babol	38.16 (7.43)	NMQ	64	-	-	-	41
Nokhostin and Zafarmand (49)	2016	-	42.18 (9.59)	Self-administered	600	-	-	-	51.87
Zahedpasha et al. (50)	2016	Isfahan	37.8 (8.3)	Nordic	116	43.1	-	-	56.9
Koosha et al. (51)	2016	Tehran	38.28 (6.76)	NMQ & RULA	100	58	-	-	60
Mohseni-Bandpei et al. (52)	2017	Tehran	41.30 (8.43)	VAS	300	31.4	-	-	-
Aliakbari et al. (53)	2018	Bojnourd	-	Nordic	63	50.8	-	-	47.6
Shirinbak et al. (54)	2018	Zanjan	37.1	Nordic	120	24.2	-	-	20.8
Yazdanian et al. (55)	2018	Tehran	40.83 (8.2)	Nordic	66	-	49	44	66
Hosseini et al. (56)	2019	Shiraz	35.6 (8.7)	NMQ	136	-	61.6	35.3	37.5
Nadri et al. (44)	2019	Tehran	38.7 (6.6)	VAS	84	44.9	-	-	-
Khandan et al. (57)	2020	Qom	40.06 (9.53)	BPAI	51	-	45.5	34.1	72.7
Karapor et al. (58)	2020	Ilam	39.22 (5.53)	Nordic	18	77.8	-	-	66.7
Shahraki Ebrahimi et al. (59)	2021	Zahedan	37.6 (8.9)	Nordic	102	72.5	-	-	77.5
Hadadi et al. (60)	2021	Bojnourd	38.32 (6.32)	Nordic	28	50	-	-	71.4
Koochak Dezfouli et al. (61)	2022	Sari	43.47 (7.78)	Nordic	90	-	22.2	24.4	43.3
Hosseini and Roshani (62)	2023	Urmia	41.6 (28.51)	Nordic	76	35	-	-	53
Roozegar et al. (63)	2023	Ilam	26.36 (10.77)	Nordic	53	43.4	-	-	52.8
Rahbar et al. (64)	2023	Ahwaz	30.41 (6.22)	Nordic	152	-	59.2	53.3	71.1
Nasiri et al. (65)	2015	Rasht	-	Nordic	99	-	-	-	98.8

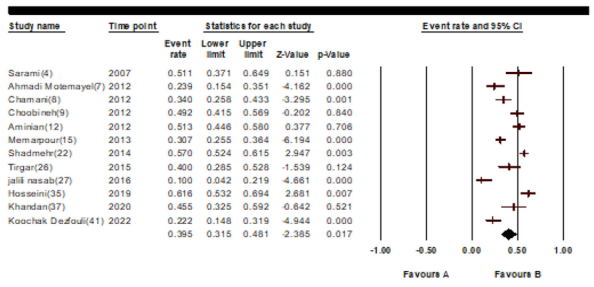

Figure 2. Prevalence of upper back pain (UBP) in Iranian dentists

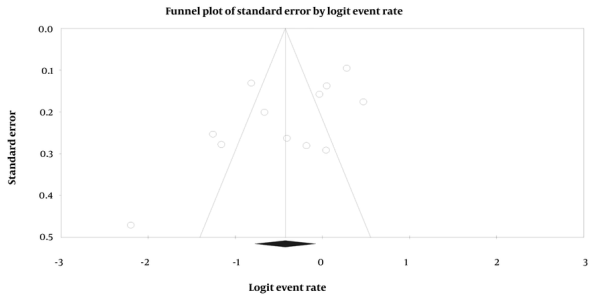

Figure 3. Upper back pain (LBP) funnel plot

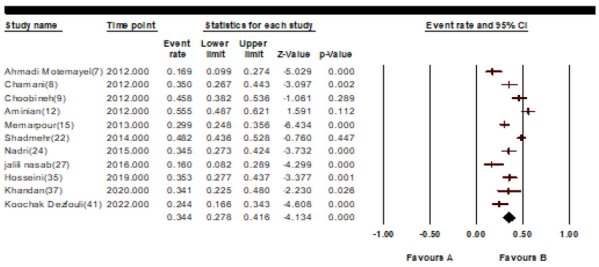

Figure 4. Prevalence of lower back pain (LBP) in Iranian dentists

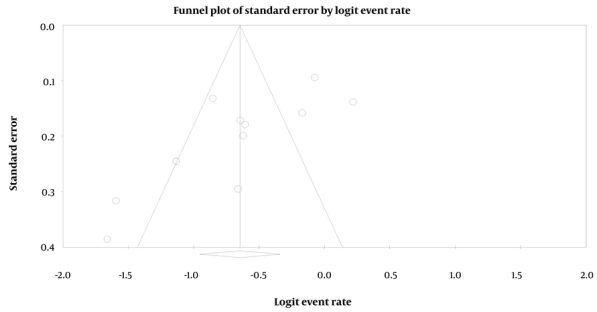

Figure 5. Lower back pain (LBP) funnel plot

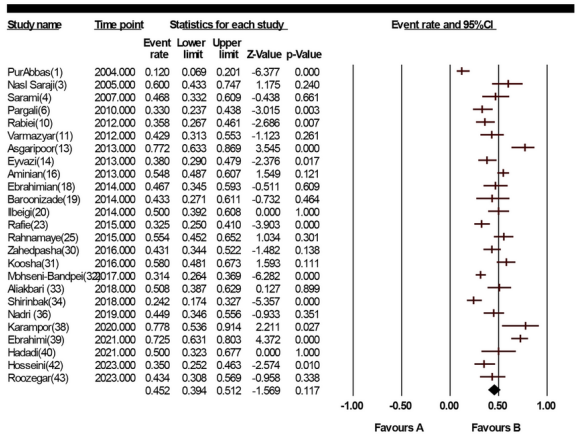

Figure 6. Prevalence of back pain in Iranian dentists

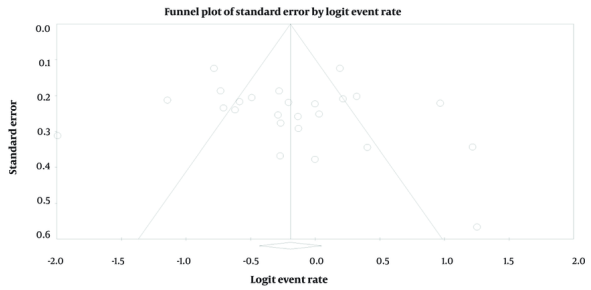

Figure 7. Back pain funnel plot

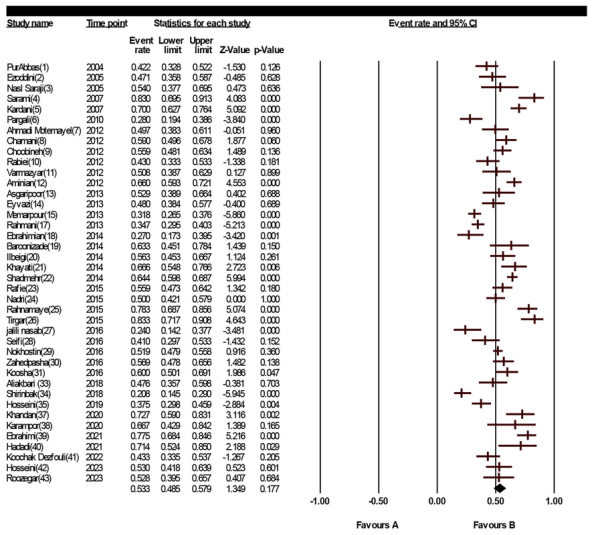

Figure 8. Prevalence of neck pain in Iranian dentists

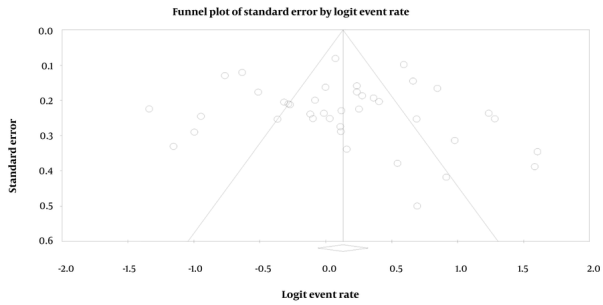

Figure 9. Neck pain funnel plot

7. Discussion

Pain causes various complications, including disability and reduced life expectancy for patients. For this reason, it is important to identify the prevalence of pain (5, 17, 18, 66). In this study, the prevalence of neck pain in Iranian dentists was 53.3% [CI = 48.5 - 57.9]. In the study of Ohlendorf et al., the prevalence of neck pain related to the last 12 months in 204 Brazilian dentists was 55.4% (67). In the study of Rehan et al. in 270 Pakistani dentists, it was 23% (68), and in Shekhawat's study et al., neck pain was reported as 5.6% "always" and 55% "sometimes" (69). Paying attention to the prevalence of neck pain in dentists and implementing preventive and therapeutic interventions to address it is very important and necessary (70, 71).

Results showed that the prevalence of back pain was 45.2% [CI = 39.4 - 51.2]. In the study of Al-Mohrej et al., conducted on 204 Saudi Arabian dentists (103 men and 101 women), the Prevalence of LBP was 68.1% (72). In the study of Gaowgzeh et al., involving 60 dentists with an average age of 25.7 years, the prevalence of LBP was 70%, with 9.5% of dentists reporting it at an extreme level (73). Similarly, in the study by Ohlendorf et al. on qualified dental assistants, results showed that 86.9% of the surveyed individuals reported back pain (74).

Results showed that the prevalence of UBP in the last 12 months was 39.5% [CI = 31.5 - 48.1], and the prevalence of LBP was 34.4% [CI = 27.8 - 41.6]. In the study of Ohlendorf et al., conducted on 450 German dentists (163 men and 287 women), the prevalence of UBP was 33.3%, and the prevalence of LBP was 45.8% (67). In the study by Akesson et al., among dentists, the prevalence of UBP was 53%, and the prevalence of LBP was 49% (75). In the study by Kumar et al., involving 646 dentists in India, the prevalence of UBP was 18.65%, and the Prevalence of LBP was 72.01% (76).

The strengths of this study include its novelty and the reporting of the status of back pain and neck pain in dentists in Iran. One of the weaknesses of this study is the failure to report all types of pain in dentists. For this reason, it is recommended that another study be conducted to investigate the prevalence of other musculoskeletal pain in dentists.

5.1. Conclusions

Considering the high prevalence of neck pain and back pain among dentists in Iran, it is necessary to implement preventive measures to reduce neck and back pain in this professional group.

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Footnotes

Authors' Contribution: M. R., F. F., and A. V. conceived the study, performed data analysis, and wrote the manuscript, collected data and wrote the manuscript, interpreted the results and wrote the manuscript, designed the study, wrote, and edited the manuscript.

Conflict of Interests Statement: The authors declared that they have no conflict of interest.

Data Availability: The dataset presented in the study is available upon request from the corresponding author during submission or after publication.

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