Systematic review and meta-analysis of verbal and physical violence against healthcare workers in the Eastern Mediterranean Region

Özgür Önal[1], Fatma Y Evcil[1], Kıymet Batmaz[1], Betül Çoban[1] and Edanur Doğan[1]

[1]Suleyman Demirel Universitesi, Tip Fakultesi (Faculty of Medicine, Suleyman Demirel University), Isparta, Türkiye. (Correspondence to Fatma Y. Evcil: fyagmuro@gmail.com).

Abstract

Background: Workplace violence is a serious threat to healthcare workers worldwide.

Aim: We aimed to determine the prevalence of physical and verbal violence against healthcare workers in the WHO Eastern Mediterranean Region and Türkiye.

Methods: We searched the Medline (via PubMed), Cochrane Library, Scopus, Science Direct, Web of Science and ProQuest databases along with reference lists from selected articles. Studies of health workers exposed to verbal and/or physical violence by patients or their relatives conducted in the WHO Eastern Mediterranean Region and Türkiye among staff working in hospitals and primary health care services were included. Seventy-five of the 3513 articles identified of studies conducted during 1999–2021 were eligible. The data were analysed using MetaXL version 5.3 and STATA version 16.

Results: This study covered 69 024 healthcare workers from 22 countries. Meta-analysis showed that 63.0% (95% CI: 46.7–79.2) of them had experienced verbal violence and 17.0% (95.0% CI: 14.0–21.0) experienced physical violence. There was no significant difference for sample size, professional group, quality score, or response rate. The frequency of physical and verbal violence in the subgroup analysis was statistically significantly different for countries and years.

Conclusion: Findings from this study provide useful information for policymaking regarding interventions to prevent or minimize violence against healthcare workers in the Eastern Mediterranean Region and Türkiye.

Keywords: verbal violence, physical violence, health care workers, Eastern Mediterranean Region, systematic review, meta-analysis

Citation: Önal Ö, Evcil FY, Batmaz K, Çoban B, Doğan E. Systematic review and meta-analysis of verbal and physical violence against healthcare workers in the Eastern Mediterranean Region. East Mediterr Health J. 2023;29(10):819–830. https://doi.org/10.26719/emhj.23.083

Received: 23/12/22; Accepted: 03/03/23

Introduction

Workplace violence is a serious public health problem that threatens healthcare workers worldwide. Health care workers are an occupational group at high risk of workplace violence (*1*). The World Health Organization has reported that at least 3 out of every 5 healthcare workers had been exposed to violence over the previous year (*2,3*). Violence negatively affects the health of all employees working in health institutions, from cleaning staff to doctors. Workplace violence includes threats, abuse and attacks that occur in work-related conditions and may affect the health of employees (*4*). All kinds of behaviours, from threats and insults to murder, are considered within the scope of workplace violence (*5*).

Violence in the workplace is examined under 2 main headings: physical and psychological. Physical violence is defined as the use of physical force, causing physical, psychological or sexual problems in the victim. Many situations, such as pushing, kicking, hitting, slapping and injuring with an object, are examples (*4*). According to WHO, health workers are exposed to physical violence at rates ranging from 8% to 38% throughout their careers (*1*). It has been reported that 24.4% of healthcare workers have been exposed to physical violence in the previous year (*3*).

Psychological violence is any behaviour that negatively affects the individual psychologically (*4*). Verbal violence, such as insulting, shouting, threatening, swearing, etc., is the most common subdimension of psychological violence (*6–9*). According to WHO, negatively affected workers are exposed to verbal violence at a much higher rate than physical violence (*2*). A recent meta-analysis in China found that 61.2% of healthcare workers were exposed to verbal violence in the last year (*10*).

Violence has a negative mental, physical and social impact. Violence against healthcare workers is known to cause a number of health issues, including psychological harm, injuries and death. Decreased job satisfaction and staff quitting their positions are also among the consequences (*11*). Therefore, violence in the health sector is a significant issue that has a direct impact on the health of employees and an indirect impact on the health of patients.

Determining the frequency of the violence that healthcare workers are exposed to is important for protecting the health of employees and the society. Studies have been conducted on the prevalence of violence among healthcare workers in different regions, however, we did not find any systematic review or meta-analysis that reported the frequency of violence (physical or verbal)

among healthcare workers in the Eastern Mediterranean Region and compared different subgroups (country, occupation, time interval, sample size, study year, quality score, response rate). One meta-analysis conducted worldwide on this subject examined a specific subgroup and the prevalence of physical violence experienced in the previous year only (12). Detailed examination of health violence in the Eastern Mediterranean Region, as in our study, will reveal the regional dimensions of the problem.

In this study, we aimed to determine the prevalence of physical and verbal violence experienced by healthcare workers in the Eastern Mediterranean Region during one year and throughout their careers.

Methods

Study design

This study was conducted in accordance with the Preferred Reporting Elements for Systematic Reviews and Meta-analyses (PRISMA) (13) and was registered in the International Prospective Systematic Review Registry (PROSPERO) under the code CRD42022314256. It is a meta-analysis that used the checklist of the Meta-Analysis of Observational Studies in Epidemiology guidelines design. The specified guideline includes recommendations on reporting background, search strategy, methods, results, discussion and conclusions (14).

Search strategy

We searched 6 academic databases, MEDLINE (via PubMed), Cochrane Library, Scopus, Science Direct, Web of Science and ProQuest, with words arranged in accordance with MeSH terms. Search strategies for each database are shown in Table 1. The following search terms were used: "physical violence", "verbal violence", "workplace violence", "nurse", "doctor", "health care professional", "prevalence" and "incidence".

Study selection and selection criteria

We reviewed and selected studies based on the following previously defined inclusion criteria: conducted in the countries of the WHO Eastern Mediterranean Region and Türkiye due to their sociocultural proximity; participants working in hospitals and primary health care services; and studies conducted on health workers exposed to verbal and/or physical violence by patients and their relatives. Only observational studies reporting prevalence of violence were included in the systematic review and meta-analysis, and only studies published in English were selected.

Studies were excluded based on the following exclusion criteria: randomized controlled trials and systematic reviews; studies whose main research topic was mobbing and burnout; studies in which the cause of violence was conflict and chaos in the country; and studies dealing with only sexual violence among healthcare professionals.

All the data collected through literature search were transferred to Excel, and duplicates were removed. Scanning of titles and abstracts for these studies was done by referees. Unclear titles/summaries were scanned by another reviewer and discussed by the reviewers until approval for inclusion or exclusion was obtained. All reviewers independently scanned full-text articles using a standardized search tool and the eligibility criteria such as country of study, study design, type of publication and sample studied. Studies meeting all criteria were included in the review. Conflicts regarding inclusion or exclusion of studies were discussed and resolved.

We used PRISMA for the systematic review and selection of studies to be included in the meta-analysis.

Quality assessment

Loney criteria (8 items) were used for the quality scoring of studies evaluated in this review (15). The criteria were: sampling method (random sample or whole population), sampling frame (defining the study population), sample size (< 355 or ≥ 355), questioning the violent event (using standard measurement form/other), unbiased measurement, response rate (< 70% or ≥ 70%), confidence intervals (CIs) and subgroup details and study subject. The total score was calculated by giving a score to the studies for each item; the overall scores ranged from zero to 8 points, with higher scores indicating higher quality.

Table 1 Search terms

	Search terms
Violence	Aggression OR Violence OR Abuse* OR Occupational İnjur* OR Assault OR Bullying OR Harassment OR Threat* OR Attack
Professional group	Physician* OR Medical Staff OR Nurs* OR Doctor OR Dent* OR Assistant OR General Practitioner* OR Allied Health Personnel OR Allied AND Health AND Personnel OR Allied Health Personnel OR Doula S OR Doulas OR Doulas OR Doula OR Health Personnel OR Health* AND Personnel OR Worker* OR Employee* OR Professional OR Provider OR Staff
Country	East Mediterr* OR Turk* OR İraq* OR Syria* OR İran* OR Afghan* OR Bahrain* OR Djibouti* OR Egypt* OR Jordan* OR Kuwait* OR Leban*OR Libya*OR Morocc* OR Oman* OR Palestin* OR Pakistan* OR Qatar* OR Saudi Arab* OR Somali* OR Sudan* OR Tunisia* OR United Arab Emirates OR Yemen*
	NOT (Child Abuse OR İntimate Partner OR Abuse)
	AND Humans AND Adult AND English

Statistical analysis

Data were analysed using MetaXL, version 5.3, and STATA, version 16. Small-study effects and publication bias were examined using the Luis Furuya-Kanamori (LFK) index, the Doi plot and the funnel plot (*16*). The Doi plot has been reported to be more intuitive and the LFK index more robust than the traditionally used Egger's regression-intercept test (*17*). An LFK index value > 1 or < 1 indicates minor asymmetry, and values > 2 or < 2 indicate major asymmetry. For optimal interpretation, at least 5 studies are required, therefore only the LFK index and Doi plots relating to the prevalence of physical and verbal violence in the last year and during the career period were prepared for the subgroups. The LFK index was calculated by applying double arcsin, logit, and no transformation to the prevalence data, and the value with the least asymmetry was used in the analysis. Graphics and tables related to this subject are available from the authors on request.

Both the Cochran Q test and the I^2 statistics were used to test the heterogeneity of the data (*18*). Significant heterogeneity between studies was assumed to be $P < 0.1$ or $I^2 > 50\%$ (*19*). If significant heterogeneity was observed between studies, a random effects model was adopted to calculate the prevalence of physical and verbal violence; otherwise, a fixed effects model was adopted. The same procedure was followed to generate meta-analytically derived national estimates of the prevalence of workplace violence (physical and verbal) based only on studies available from each country. Meta-analytical estimates could not be calculated for countries with < 2 studies (*20*). Prevalence estimates for the countries where the studies were conducted (Bahrain, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Pakistan, Palestine, Saudi Arabia, Syrian Arab Republic, Türkiye), the year of study (2010 and before vs 2011 and later) and sample size (< 355 and ≥ 355) were analysed by subdividing the professional group (physicians only, nurses only, all health care workers), quality score (< 6 vs ≥ 6) and response rate (< 70% and ≥ 70%). Statistical significance was set at $P < 0.05$.

Results

Study characteristics

For the systematic review and meta-analysis, a keywords search was carried out on the 6 academic databases, and 3513 articles were identified (Figure 1). After removing duplicates, 2675 articles were scanned for titles and abstracts. The remaining 274 full texts were reviewed, and we included 75 studies that met the eligibility criteria.

The selected studies were examined under 2 separate headings according to the type of violence, physical and verbal. Prevalence of violence was evaluated in 2 groups according to the time interval as "last year of the study (last year, last 6 months, last 2 months)" and "during career". From the meta-analysis, 69 (92.0%) studies covered the prevalence of physical violence, 18 (24.0%) covered the frequency of physical violence encountered throughout the career, and 51 (68.0%) covered the frequency of physical violence encountered in the last year. Also from the meta-analysis, 71 (94.7%) studies included the prevalence of verbal violence, 17 (22.7%) the frequency of verbal violence encountered throughout the career, and 54 (72.0%) the frequency of verbal violence in the last year.

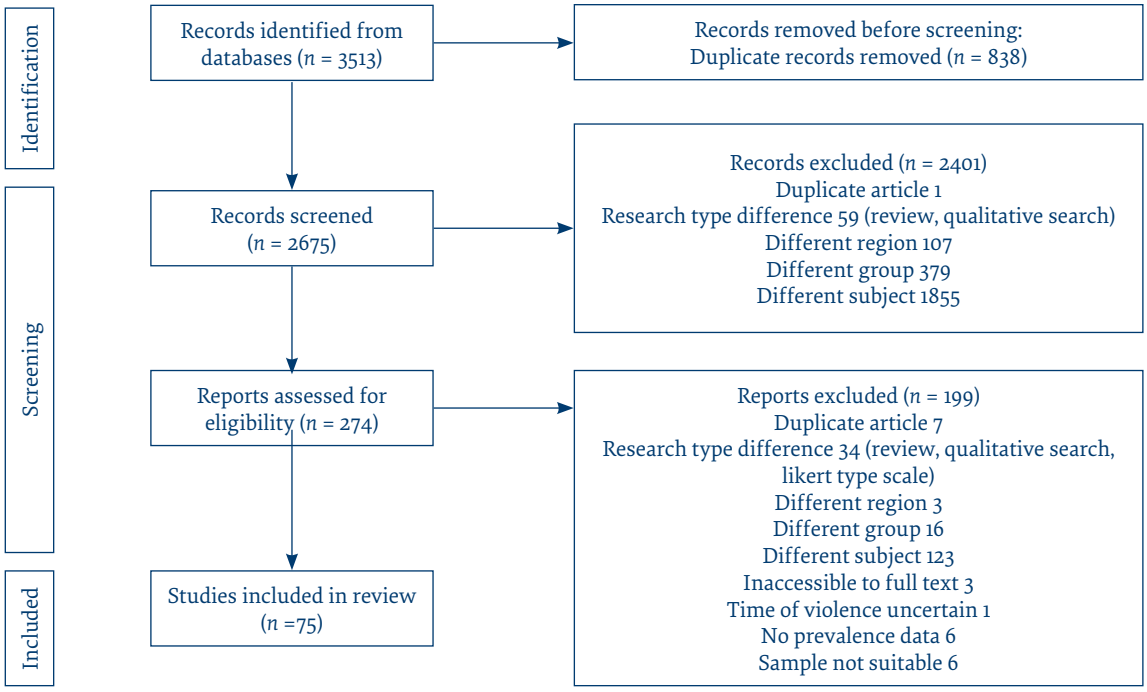
The studies included in the systematic review and meta-analysis were conducted between 1999 and 2021. Although violence was examined through the questionnaires used for these studies, no standard measurement tool was used in all of the studies. While the scale developed by WHO/ILO was used in 22 (29.4%) studies, other scales were used in 6 (8.0%) studies. In 47 (62.7%) studies, the questions were created by the researchers, i.e. they did not use any standard scales. The total number of healthcare workers examined in all studies was 69 024. Among the studies examining physical violence, 50 (66.7%) were from 2011 and later. Data from 61 241 healthcare workers were assessed in studies on the frequency of physical violence. Fifty (66.7%) studies evaluating the prevalence of verbal violence were conducted in 2011 and later. The total number of healthcare workers covered in the studies examining verbal violence was 62 261. The countries that had the highest number of studies on both physical and verbal violence were Türkiye and Saudi Arabia.

The mean quality score (Loney score) for the 75 studies reviewed was 5.2, with 34 (45.4%) scoring ≥ 6 (Table 2). Of the studies reporting the frequency of physical violence, 12 (16.0%) were conducted on physicians only and 23 (30.7%) on nurses only. Ammong those studies reporting the prevalence of verbal violence, 10 (13.4%) included only physicians and 27 (36.0%) included only nurses. An equal number of studies evaluated more than 1 occupational group for both physical and verbal violence. Since the frequency of verbal violence was examined in many categories in the 1 (1.4%) study included, and the participants could choose more than one proposition, the net frequency of this type of violence could not be calculated, and only the frequency of physical violence was included in the meta-analysis for that study (*21*).

For the calculation of the frequency of verbal violence in another study, the category sexual violence, which had been included with non-physical violence, was not included in the frequency of verbal violence (*22*), which we calculated as 57.9% for that study.

Publication bias was checked using a funnel plot. In the funnel plot analysis, although the prevalence of physical and verbal violence was symmetrical in the studies included in the meta-analysis, mean differences were widely spread. This may have occurred due to variations in sociodemographic characteristics. It was observed that the studies concentrated on a low level of standard errors, an indication that the sample size in most studies was satisfactory.

Figure 1 Flow chart showing identification of relevant observational studies in relation to workplace violence



The prevalence values obtained from the studies were transformed in accordance with the LFK index scores: transformation with the lowest LFK index was applied. The transformations applied in this framework are presented in Table 3.

Prevalence of physical violence against healthcare workers

We analysed 18 studies to determine the prevalence of physical violence encountered by healthcare workers in the Eastern Mediterranean Region throughout their careers, in the last year, in the previous 6 months, and in the last 2 months. The estimated frequency was 23.4% (95% CI: 16.1–32.0) (Table 4). There was significant heterogeneity among the studies reviewed (Q = 1224.4, $P < 0.001$, $I^2 = 99\%$). The prevalence of physical violence in the last year was calculated at 19.0% (95% CI: 15.4–22.6) by pooling the data reported from 51 studies showing high heterogeneity (Q = 4024.39, $P < 0.001$, $I^2 = 99\%$).

Studies reporting the frequency of physical violence encountered throughout the career were conducted in the Islamic Republic of Iran, Iraq, Jordan, Morocco, Saudi Arabia and Türkiye. Prevalence varied between 8.0% (95% CI: 0.5–15.5) and 39.5% (95% CI: 0.1–97.3) by country, with a statistically significant difference between countries for the prevalence of physical violence ($P < 0.027$) (Table 4). The prevalence of physical violence in the last year was reported in more studies, and the estimates ranged from 10.6% (95% CI: 2.2–19.1) to 42.2% (95% CI: 33.3–51.1). The frequency of being exposed to physical violence in the last year also differed significantly between countries ($P < 0.001$).

When the studies were analysed according to the occupation of the healthcare professionals, the highest frequency of physical violence throughout the career was reported in studies involving only physicians (31.0%; 95% CI: 9.5–52.5). For studies reporting physical violence during the previous year, the highest prevalence (23.4%, 95% CI: 17.0–29.9) was reported in those that included only nurses. There was no statistically significant difference between the frequency of physical violence according to the occupational group for both time intervals investigated (during career, $P = 0.412$; for the last year, $P = 0.147$).

For studies examining the frequency of physical violence throughout the career, the prevalence calculated for those conducted in 2011 and later (29.7%; 95% CI: 17.9–41.4) was statistically significantly higher than that for studies conducted over the previous years (15.6%; 95% CI: 10.3–21.0) ($P = 0.033$). In studies examining the frequency of physical violence during the previous year, there was no significant difference in prevalence between studies conducted in in these 2 periods ($P = 0.564$).

Studies included in the meta-analysis were further divided into subgroups based on sample size (< 355 and ≥ 355), response rate (< 70% and ≥ 70%) and quality score (< 6 vs ≥ 6). There was no significant difference between these subgroups in terms of the frequency of physical violence healthcare workers were exposed to throughout their career or during the last year ($P > 0.05$).

Prevalence of verbal violence against healthcare workers

We analysed 71 studies to determine the prevalence of verbal violence. Data from 17 studies reporting the frequency of exposure to verbal violence during the professional career were pooled and the frequency of verbal violence was estimated at 73.7% (95% CI: 67.8–80.4)

Table 2 Loney criteria quality scores for 75 studies from the WHO Eastern Mediterranean Region and Türkiye conducted during 1999–2021

Study	Country	Loney criterion[a]								Total quality score
		1	2	3	4	5	6	7	8	
Abbas et al. 2010	Egypt	1	1	1	0	0	0	1	1	5
Abdellah et al. 2017	Egypt	0	0	0	0	0	1	1	1	3
Abou-ElWafa et al. 2015	Egypt	1	1	0	1	0	1	1	1	6
Abualrub et al. 2007	Iraq	0	0	0	1	0	1	0	1	4
Abualrub et al. 2014	Jordan	0	0	1	1	0	1	0	1	4
Acik et al. 2008	Türkiye	1	1	1	1	0	1	1	1	7
Adib et al. 2002	Kuwait	1	1	1	1	0	1	0	1	6
Ahmed, 2012	Jordan	1	0	1	1	1	1	0	0	5
Akbolat et al. 2021	Türkiye	1	1	0	1	1	1	0	1	6
Al Anazi et al. 2020	Saudi Arabia	1	1	0	0	1	1	1	1	6
Alameddine et al. 2011	Lebanon	1	1	0	1	1	1	1	1	7
Alameddine et al. 2015	Lebanon	1	0	1	0	1	0	0	1	4
AlBashtawy et al. 2013	Jordan	0	0	1	1	0	0	0	1	3
AlBashtawy, 2013	Jordan	0	1	0	1	0	0	1	1	4
Algwaiz et al. 2012	Saudi Arabia	1	1	1	1	0	0	1	1	6
Alhamad et al. 2021	Jordan	1	1	1	0	1	0	0	0	4
Alharbi et al. 2021	Saudi Arabia	0	1	1	1	0	1	0	1	5
Al-Omari et al. 2015	Jordan	1	1	1	1	1	1	0	0	6
Al-Omari et al. 2019	Jordan	0	0	0	1	1	0	0	0	2
Alqahtani et al. 2020	Saudi Arabia	0	0	0	1	1	1	1	1	5
Alsaleem et al. 2018	Saudi Arabia	1	0	1	1	1	1	1	1	7
Al-Shaban et al. 2021	Saudi Arabia	0	1	0	1	1	1	1	1	6
Alshahrani et al. 2021	Saudi Arabia	1	1	1	0	1	1	0	1	6
Alshamlan et al. 2017	Saudi Arabia	1	1	1	1	0	1	1	1	7
Alsmael et al. 2020	Saudi Arabia	1	1	1	0	1	0	1	1	6
Arafa et al. 2022	Egypt	0	0	0	1	0	0	1	1	3
Atawneh et al. 2003	Kuwait	1	1	0	1	0	1	1	0	5
Ayranci et al. 2005	Türkiye	0	0	0	1	1	1	1	1	5
Ayranci et al. 2006	Türkiye	1	1	1	1	0	1	1	1	7
Baig et al. 2018	Pakistan	0	0	1	1	0	1	1	1	5
Baykan et al. 2015	Türkiye	1	0	1	1	1	1	1	1	7
Bayram et al. 2017	Türkiye	1	1	1	1	1	1	1	1	8
Belayachi et al. 2010	Morocco	1	0	0	1	0	0	1	0	3
Boz et al. 2006	Türkiye	0	0	0	1	0	0	0	0	1
Cevik et al. 2020	Türkiye	0	0	1	0	0	1	0	0	2
Coskun, 2019	Türkiye	0	0	0	1	0	0	1	1	3
Darawad et al. 2015	Jordan	0	0	0	1	0	0	1	1	3
Demirci et al. 2020	Türkiye	1	1	1	1	0	1	1	1	7
Emam et al. 2018	Iran, IR	1	0	0	1	0	1	1	1	5
Erdur et al. 2015	Türkiye	1	1	0	0	0	1	1	1	5
Esmaeilpour et al. 2011	Iran, IR	0	0	0	1	1	1	0	0	3
Fallahi-Khoshknab et al. 2015	Iran, IR	1	1	1	1	0	1	1	1	7
Fallahi-Khoshknab et al. 2016	Iran, IR	1	0	1	0	1	1	1	1	6
Ghareeb et al. 2021	Jordan	1	1	1	1	0	1	0	1	6
Gunaydın et al. 2012	Türkiye	1	1	1	1	0	0	0	1	5
Hamdan et al. 2015	Palestine	1	1	1	1	1	1	1	1	8
Hamzaoglu et al. 2019	Türkiye	0	1	1	0	0	1	1	1	5

Table 2 Loney criteria quality scores for 75 studies from the WHO Eastern Mediterranean Region and Türkiye conducted during 1999–2021 *(concluded)*

Study	Country	Loney criterion[a]								Total quality score
		1	2	3	4	5	6	7	8	
Harthi et al. 2020	Saudi Arabia	0	0	0	1	0	1	1	1	4
Honarvar et al. 2019	Iran, IR	1	1	1	1	0	1	1	1	7
Jafree, 2017	Pakistan	1	1	0	1	0	0	1	1	5
Jaradat et al. 2018	Palestine	0	0	0	0	0	1	1	1	3
Khademloo et al. 2013	Iran, IR	1	0	0	1	1	1	0	0	4
Khan et al. 2021	Pakistan	1	1	1	1	1	0	1	1	7
Kisa et al. 2008	Türkiye	1	1	0	1	0	1	0	1	5
Kitaneh et al. 2012	Palestine	1	1	0	1	1	1	1	1	7
Lafta et al. 2019	Iraq	1	1	1	1	1	1	1	1	8
Mirza et al. 2012	Pakistan	1	0	1	1	1	1	1	1	7
Mohamad et al. 2021	Syrian Arab Republic	0	0	1	1	0	1	1	1	5
Oztok et al. 2018	Türkiye	1	0	1	1	1	0	0	1	5
Oztunc, 2006	Türkiye	1	1	0	1	0	0	0	1	4
Pinar et al. 2017	Türkiye	1	1	1	1	0	1	1	1	7
Picakcıefe et al. 2012	Türkiye	1	1	0	1	0	1	1	1	6
Rafeea et al. 2017	Bahrain	0	1	0	0	1	1	1	1	5
Rahmani et al. 2012	Iran, IR	1	1	0	1	1	0	0	0	4
Sadrabad et al. 2019	Iran, IR	1	1	0	1	1	1	0	0	5
Samir et al. 2012	Egypt	1	1	1	1	1	1	0	0	6
Sani et al. 2020	Iran, IR	0	1	0	0	0	1	0	1	3
Shaikh et al. 2020	Pakistan	1	1	1	0	1	1	1	1	7
Shoghi et al. 2008	Iran, IR	0	1	1	0	1	1	1	1	6
Teymourzadeh et al. 2014	Iran, IR	1	1	0	1	0	1	1	1	6
Towhari et al. 2020	Saudi Arabia	0	1	0	0	1	1	0	1	4
Turki et al. 2016	Saudi Arabia	1	1	0	0	1	1	1	1	6
Uzun, 2003	Türkiye	0	1	1	0	1	0	0	0	3
Unsal Atan et al. 2013	Türkiye	1	1	1	1	1	0	0	0	5
Zafar et al. 2016	Pakistan	1	1	0	1	0	1	1	1	6

[a] *1: Random sample or whole population; 2: Unbiased sampling frame; 3: Adequated sample size (≥ 355); 4: Measures were standard; 5: Outcomes measured by unbiased assessors; 6: Adequated response rate (≥ 70); 7: Confidence intervals, subgroup analysis; 8: Study subject defined.*

Table 3 Luis Furuya-Kanamori index for the studies reviewed

Type of violence	No. of studies	LFK index value		
		No transformation	Double arcsin transformation	Logit transformation
Verbal violence (total)	71	2.42 (major asymmetry)	3.63 (major asymmetry)	4.12 (major asymmetry)
Physical violence (total)	69	5.42 (major asymmetry)	3.53 (major asymmetry)	−0.94 (no asymmetry)
Verbal violence during career	17	−1.19 (minor asymmetry)	2.41 (major asymmetry)	3.47 (major asymmetry)
Verbal violence in last 1 year	54	2.63 (major asymmetry)	3.59 (major asymmetry)	3.88 (major asymmetry)
Physical violence during career	18	2.81 (major asymmetry)	0.46 (no asymmetry)	−1.19 (minor asymmetry)
Physical violence in last 1 year	51	5.81 (major asymmetry)	3.98 (major asymmetry)	−0.96 (no asymmetry)

(Table 4). The frequency of exposure to verbal violence in the last year was calculated at 59.9% (95% CI: 54.7–65.1) (data from 54 studies). Heterogeneity was found between studies examined for both time intervals (during career Q = 784.76, $P < 0.001$, $I^2 = 98\%$; Q = 10 150.03, $P < 0.001$, $I^2 = 99\%$).

When analysed by country of study, the frequency of verbal violence throughout the career ranged from 63.0%

Table 4 Subgroup analysis of physical and verbal violence reported in 75 studies from the WHO Eastern Mediterranean Region and Türkiye conducted during 1999–2021

Subgroup	During career						Last 1 year or less					
	Pooled prevalance		I^2	No. of studies	χ^{2a}	P	Pooled prevalence		I^2	No. of studies	χ^{2a}	P
	%	95% CI					%	95% CI				
Physical violence												
Country												
Türkiye	25.0	14.1–35.9	98.97	9	12.68	0.027	19.6	9.5–29.8	99.32	8	45.45	< 0.001
Iran, IR	39.5	0.1–97.3	99.65	2			24.1	19.2–29.1	93.98	8		
Pakistan		–		–			20.9	1.3–43.1	99.91	6		
Jordan	21.0	14.5–27.5		1			22.2	10.2–34.2	98.78	7		
Saudi Arabia	32.2	4.8–59.6	99.58	4			11.2	4.3–18.1	97.72	7		
Egypt		–		–			18.9	5.9–31.9	98.45	5		
Lebanon		–		–			17.0	2.1–31.8	96.67	2		
Kuwait		–		–			10.6	2.2–19.1	78.07	2		
Palestine		–		–			20.4	3.0–37.8	98.33	3		
Syrian Arab Republic		–		–			19.1	16.8–21.4		1		
Bahrain		–		–			11.0	4.7–17.3		1		
Iraq	14.0	11.5–16.5		1 study			42.2	33.3–51.1		1		
Morocco	8.0	0.5–15.5		1 study				–		–		
Year conducted												
2010 and earlier	15.6	10.3–21.0	86.49	4	4.53	0.033	20.7	14.0–27.3	99.21	15	0.33	0.564
2011 and later	29.7	17.9–41.4	99.34	14			18.3	14.0–22.7	99.60	36		
Sample size												
< 355	21.9	7.0–36.9	98.78	8	0.6	0.419	20.8	15.7–25.9	97.11	27	1.01	0.314
≥ 355	30.0	17.4–42.7	99.42	10			17.1	12.0–22.2	99.77	24		
Professional group												
Physician	31.0	9.5–52.5	99.63	6	1.78	0.412	14.7	6.9–22.5	98.13	6	3.83	0.147
Nurse	19.0	13.2–24.8	76.05	3			23.4	17.0–29.9	99.21	20		
All health care staff	25.8	12.4–39.3	99.18	9			16.5	11.8–21.2	99.61	25		
Quality score												
< 6	30.3	15.4–45.3	99.34	11	1.41	0.235	18.8	13.7–23.9	98.52	26	0.01	0.918
≥ 6	20.4	13.5–27.2	97.05	7			19.2	14.0–24.4	99.75	25		
Response rate												
< 70%	22.6	11.2–34.1	91.67	3	0.30	0.581	16.3	8.7–23.8	99.59	16	0.84	0.360
≥ 70%	27.2	15.8–38.5	99.42	15			20.3	16.3–24.2	99.43	35		
Total	23.4	16.1–32.0	99.0	18	–		19.0	15.4–22.6	99.00	51	–	
Verbal violence												
Country												
Türkiye	75.9	66.7–85.1	98.37	9	26.02	< 0.001	62.4	50.5–74.3	99.25	10	160.08	< 0.001
Iran, IR	79.1	55.6–99.0	97.82	2			80.7	73.0–88.4	98.49	8		
Pakistan		–		–			45.0	30.7–59.4	99.22	6		
Jordan	87.0	82.0–92.0		1			59.8	52.1–67.4	95.06	8		
Saudi Arabia	63.0	46.7–79.2	98.31	4			46.9	38.7–55.1	94.59	8		
Egypt		–		–			49.7	30.6–68.8	98.77	5		
Lebanon		–		–			71.4	52.8–90.1	97.04	2		
Kuwait		–		–			66.8	29.6–99.0	98.97	2		
Palestine		–		–			50.7	23.6–77.7	98.97	3		
Syrian Arab Republic		–		–			85.0	83.0–87.0		1		
Bahrain		–		–			78.0	70.0–86.0		1		
Iraq	72.0	68.5–75.5		1				–		–		

Table 4 Subgroup analysis of physical and verbal violence reported in 75 studies from the WHO Eastern Mediterranean Region and Türkiye conducted during 1999–2021

Subgroup	During career						Last 1 year or less					
	Pooled prevalance		I^2	No. of studies	χ^{2a}	P	Pooled prevalence		I^2	No. of studies	χ^{2a}	P
	%	95% CI					%	95% CI				
Year conducted												
2010 and earlier	63.7	46.5–80.9	98.27	3	1.63	0.201	67.9	58.3–77.4	99.38	18	4.43	0.035
2011 and later	75.8	68.5–83.2	98.06	14			55.9	50.1–61.7	99.28	36		
Sample size												
< 355	77.9	66.1–89.8	97.65	7	0.94	0.331	63.1	56.2–69.9	97.77	28	1.52	0.218
≥ 355	70.7	62.3–79.1	98.41	10			56.6	48.9–64.3	99.69	26		
Professional group												
Physicians only	77.0	67.1–86.8	97.9	5	0.45	0.799	62.2	48.7–75.7	99.47	5	4.63	0.099
Nurses only	70.3	46.7–93.9	98.60	3			65.5	56.9–74.1	99.10	24		
All health care staff	72.9	62.7–83.1	98.28	9			54.0	47.5–60.5	99.15	25		
Quality score												
< 6	74.0	63.6–84.5	98.50	10	0.02	0.899	62.5	54.8–70.3	98.99	29	1.17	0.280
≥ 6	73.1	64.3–82.0	97.77	7			56.9	50.3–63.5	99.50	25		
Response rate												
< 70%	73.6	47.5–99.8	98.79	3	0.01	0.995	60.1	50.8–69.4	98.75	18	0.01	0.960
≥ 70%	73.7	66.8–80.7	98.11	14			59.8	53.5–66.1	99.53	36		
Total	73.7	67.8–80.4	98.01	7	–		59.9	54.7–65.1	99.05	4	–	

[a]*Test of difference within each subgroup.*

(95% CI 46.7–79.2) to 87.0% (95% CI 82.0–92.0) (Table 4). Data obtained from studies conducted in the Islamic Republic of Iran, Iraq, Jordan, Saudi Arabia and Türkiye showed a statistically significant difference ($P < 0.001$). The frequency reported from studies examining verbal violence over the last year ranged from 45.0% (95% CI 30.7–59.4) to 85.0% (95% CI 83.0–87.0) by country (Table 4). The highest prevalence, 85.0%, was reported in the Syrian Arab Republic, followed by Islamic Republic of Iran, 80.7%, and Bahrain, 78.0%. There was a significant difference between the countries included in the meta-analysis for prevalence of verbal violence in the last year ($P < 0.001$).

Studies that included only physicians reported the highest frequency of verbal violence throughout the career, with a prevalence of 77.0% (95% CI: 67.1–86.8) (Table 4). The frequency of verbal violence reported in the last year was highest in studies that included only nurses (65.5%; 95% CI: 56.9–74.1). However, there was no significant difference between the frequency of verbal violence according to occupational group for both time intervals (during career, $P = 0.799$; for the last year ($P = 0.099$).

The frequency of encountering verbal violence throughout the career was higher in studies conducted during or after 2011. However, the difference was not statistically significant ($P = 0.201$) (Table 4). For studies conducted in 2010 and before reporting on encountering verbal violence during the last year, the frequency (67.9%; 95% CI: 58.3–77.4) was statistically significantly higher than in studies conducted in 2011 and after (55.9%; 95% CI: 50.1–61.7) ($P = 0.035$) (Table 4).

Studies included in the meta-analysis were divided into subgroups based on sample size (< 355 and ≥ 355), response rate (< 70% and ≥ 70%) and quality score (< 6 vs ≥ 6). There was no significant difference between these subgroups for the frequency of verbal violence participants were exposed to throughout the career and during the last year ($P > 0.05$).

Supplementary materials, including Doi plots and funnel plots, are available from the authors on request.

Discussion

In this study, we pooled the prevalence estimates of physical and verbal violence in the workplace against healthcare workers reported in 75 studies published from 1999 to 2021. A total of 69 024 healthcare workers from 22 countries in the WHO Eastern Mediterranean Region and Türkiye having similar sociocultural characteristics were included in the study. Our meta-analysis revealed that 63.0% (95.0% CI: 58.0–68.0) of healthcare workers in the Eastern Mediterranean Region experienced verbal violence and 17.0% (95.0% CI: 14.0–21.0) were exposed to physical violence. During their career, 3 out of every 5 health workers had been exposed to verbal violence and 1 out of 5 had been subjected to physical violence.

This study provides the first quantitative estimate of the prevalence of physical and verbal violence perpetrated against health workers in the WHO Eastern

Mediterranean Region. The prevalence estimates presented are based on a pool of 75 studies on healthcare workers at all levels of care and various types of professions in many countries in the Region.

Although studies from all countries in the Region were eligible for inclusion, there was none on the prevalence of physical and verbal violence from 10 countries, Afghanistan, Djibouti, Libya, Oman, Qatar, Somalia, Sudan, Tunisia, United Arab Emirates and Yemen. More than half of the eligible studies were from Türkiye (20 studies), Saudi Arabia (12 studies) and the Islamic Republic of Iran (11 studies). It is clear that more studies are needed from the low- and middle-income countries of the Region.

We determined the frequency of physical violence to be 23.4% throughout the career and 19.0% during the last year. Some reviews we examined focused on the prevalence of physical violence in the workplace for health professionals; a wide range of frequencies (2% to 32%) was reported (*3*,*23*,*24*). Li et al, who presented the prevalence estimates of physical violence in all WHO regions and the world in 2018, estimated the prevalence of physical violence in the last year in the Eastern Mediterranean Region at 17.1% (*12*). Corresponding results for other WHO regions were: Africa 20.7%; America 23.6%; Europe 26.4%; Western Pacific 14.5%; Southeast Asia 5.6%; and worldwide 19.3%. Our estimation for the Eastern Mediterranean Region was similar to the global value and higher than some regions (Western Pacific and Southeast Asia) (*12*).

We found the frequency of verbal violence against healthcare workers was 73.7% during the career and 59.9% for the last year. Previous meta-analyses have reported the frequency of verbal violence from different regions or the frequency of verbal violence experienced by a specific healthcare professional group in the Eastern Mediterranean Region (*25*,*26*). In a 2019 meta-analysis, which included studies from 5 regions of the world, the frequency of exposure to non-physical violence in the last year was 42.5%. The highest frequency was reported from North America (58.7%), followed by Asia (45.5%) and Australia (38.7%). In the same study, the most common subtypes of non-physical violence were 57.6% for verbal abuse and 33.2% for threats (*3*). In an umbrella review and meta-analysis examining violence against healthcare workers, the prevalence of verbal violence was 66.8% (*27*). In a meta-analysis of studies in China, the frequency of verbal abuse was 61.2% and the frequency of threat 39.4% (*10*). In all the meta-analyses cited above, the frequency of verbal violence was higher than that of physical violence (*3*,*10*,*27*), similar to our own findings.

In the subgroup analysis, we found no statistically significant relationship between the prevalence estimates for physical and verbal violence that health professionals were exposed to during the career and in the last year or less and sample size, response rate, quality score or professional group. The meta-analysis by Li et al reported significantly higher prevalence estimates in studies with a sample size ≤ 500, a quality score < 5 or a low response rate (*12*). However, it has also been found that studies with fewer participants may be associated with higher prevalence estimates that could be attributed to selection bias and publication bias (*28*). In a 2019 systematic review that evaluated workplace violence as physical and non-physical, nurses had the highest exposure to any type of violence, followed by doctors and other health workers (*3*). In another systematic review, nurses were exposed to physical violence more frequently than doctors (*12*). It is clear that further studies are needed to provide more evidence about violence against health workers in the workplace.

Our findings indicated that there was a significant difference between countries in terms of the frequency of verbal and physical violence, throughout the career and during the last year. Data on the frequency of verbal and physical violence throughout the career were available from only 6 countries. Only one study covering 2 countries (Iraq and Jordan) was included in the meta-analysis. These findings suggest that more studies are needed to examine the frequency of physical and verbal violence throughout the career in countries in the Region. The frequency of verbal violence in the last year has been reported in more countries and more studies, however, analysis of publication bias revealed major asymmetry between studies. The results reporting the prevalence of violence in the last year should be carefully evaluated due to the small number of countries involved, the results relating to the frequency of violence throughout the career, and the major asymmetry from publication bias. It should, however, be taken into account that each country has its own particular working environment and conditions as well as geographical and cultural differences in the perception of violence, and that no standard definition and measurement of violence was included in the studies.

We found that the year of publication was correlated with the prevalence estimates. In studies conducted in 2011 and later, physical violence throughout the career was significantly more prevalent than in those conducted in 2010 and before. For verbal violence, frequency in the last year was 67.9% in studies published in 2010 and before. This was significantly higher than the results for later years. In contrast, in our study we did not find any significant relationship reported in other systematic reviews on violence in health settings (*3*,*12*). The fact that more recent studies reported a higher prevalence of violence in our meta-analysis may be due to the increase in violence in the last decade, or it may be a result of an increase in awareness about workplace violence. Also, the number of studies conducted on violence in health has increased over the past decade, with only 23 of the 75 studies dating from 2010 or earlier.

Our study had certain strengths and weaknesses. There was no standard measurement method in studies conducted to evaluate workplace violence among health workers. There were definitional differences in terms of severity and types. The time intervals during which violence was investigated differed in the studies

we included. For this reason, we need to consider bias in recall studies that assess long-term violence (for example, throughout the career). The studies examined were analysed according to characteristics such as sample size, quality score and year of study; however, it should be considered that many other factors may affect the frequency of violence when examining the results. For example, the frequency of violence encountered throughout the career may be greater in older participants, and some participants may not report the violence they have been exposed to for fear of losing their job. A particular behaviour perceived as violence in one society may be perceived as normal in another; a circumstance that may be misleading when comparing results.

Despite these limitations, our research had some strengths. As far as we know, this is the first study examining physical and verbal violence against health workers in the Eastern Mediterranean Region. Within the scope of the study, the frequencies of physical and verbal violence were discussed separately during the whole career and in the last year. This has allowed the frequency of violence to be discussed for specific time intervals.

Conclusion

Different questionnaires and different time intervals were used in the studies examined. This makes it difficult to estimate a standard severity prevalence and compare subgroups. Using a standard questionnaire in future studies would provide clearer results. However, practical interventions in the health sector are needed to prevent or reduce workplace violence against healthcare workers. In future research, it would be helpful to examine the temporal trend of workplace violence by country to determine how country-specific social factors and policies affect it and to investigate the causes of violence and methods of prevention.

Funding: None.

Competing interests: None declared.

Examen systématique et méta-analyse des violences verbales et physiques à l'encontre des agents de santé dans la Région de la Méditerranée orientale

Résumé

Contexte : Les violences sur le lieu de travail représentent une menace sérieuse pour les agents de santé dans le monde entier.

Objectif : Déterminer la prévalence de la violence physique et verbale à l'encontre des agents de santé dans la Région de la Méditerranée orientale et en Türkiye.

Méthodes : Nous avons effectué des recherches dans les bases de données Medline (via PubMed), Cochrane Library, Scopus, Science Direct, Web of Science et ProQuest, ainsi que dans les listes de références bibliographiques d'articles sélectionnés. Nous avons inclus des études réalisées dans la Région de la Méditerranée orienale et en Turkiye qui portaient sur la violence verbale et/ou physique de la part de patients ou de leurs proches à l'encontre des agents de santé. Ces études ont été menées dans la Région de la Méditerranée orientale et en Türkiye parmi le personnel travaillant dans des hôpitaux et dans des services de soins de santé primaires. Soixante-quinze des 3513 articles identifiés parmi les études menées entre 1999 et 2021 étaient éligibles. Les données ont été analysées à l'aide des logiciels MetaXL version 5.3 et STATA version 16.

Résultats : La présente étude a été réalisée auprès de 69 024 agents de santé dans 22 pays. La méta-analyse a montré que 63,0 % d'entre eux (IC 95 % : 46,7-79,2) avaient subi des violences verbales et que 17,0 % (IC à 95,0 % : 14,0-21,0) avaient fait l'objet de violences physiques. Aucune différence significative n'a été observée en ce qui concerne la taille de l'échantillon, le groupe professionnel, le score de qualité ou le taux de réponse. La fréquence de ces violences dans l'analyse des sous-groupes était statistiquement très différente selon les pays et les années.

Conclusion : Les résultats tirés de la présente étude sont très utiles afin d'orienter l'élaboration de politiques concernant les interventions visant à prévenir ou à réduire les violences à l'encontre des agents de santé dans la Région de la Méditerranée orientale et en Türkiye.

استعراض منهجي وتحليل تلوي للعنف اللفظي والبدني ضد العاملين في مجال الرعاية الصحية في إقليم شرق المتوسط

أوزغور أونال، فاطمة ياغمور إفجيل، كيميت باتماز، بتول جوبان، أدانور دوغان

الخلاصة

الخلفية: يمثل العنف في مكان العمل تهديدًا خطيرًا للعاملين في مجال الرعاية الصحية في جميع أنحاء العالم.

الأهداف: هدفت هذه الدراسة الى تحديد معدل انتشار العنف البدني واللفظي ضد العاملين في مجال الرعاية الصحية في إقليم شرق المتوسط لمنظمة الصحة العالمية وتركيا.

طرق البحث: بحثنا في قاعدة بيانات مدلاين (بواسطة محرك PubMed)، ومكتبة Cochrane، وقاعدة بيانات Scopus، وموقع إلى جانب قوائم مرجعية من مقالات مختارة. وشمل البحث ، ProQuest ومجموعة قواعد بيانات ، Web of Science ومنصة ، Science Direct الدراسات التي أجريت على العاملين الصحيين الذين يتعرضون للعنف اللفظي و/ أو البدني من المرضى أو من ذويهم في المستشفيات وخدمات مقالة حُدِّدت 3513 مقالة لأغراض البحث من أصل 75 الرعاية الصحية الأولية في إقليم شرق المتوسط لمنظمة الصحة العالمية وتركيا. وتأهلت من 16 والإصدار ،Meta XL من برنامج 5.3 وحُللت البيانات باستخدام الإصدار .1999–2021 من الدراسات التي أجريت خلال الفترة STATA.

النتائج: شملت هذه الدراسة 69024 عاملًا في مجال الرعاية الصحية من 22 بلدًا. وأظهر التحليل التلوي أن 63.0٪ (فاصل الثقة 95٪ تعرضوا للعنف البدني. ولم يُكتشف أي اختلاف (21.0 –14.0 :95.0٪ فاصل الثقة) 17.0٪ منهم تعرضوا للعنف اللفظي، و (79.2 – 46.7 : مهم من حيث حجم العينة، أو الفئة المهنية، أو درجة الجودة، أو معدل الاستجابة. وكان تواتر العنف البدني واللفظي في تحليل المجموعة الفرعية مختلفًا اختلافًا ذا دلالة إحصائية باختلاف البلدان والسنوات.

الاستنتاجات: توفر نتائج هذه الدراسة معلومات مفيدة لتوجيه عملية وضع السياسات المتعلقة بالتدخلات الرامية إلى منع العنف ضد العاملين في مجال الرعاية الصحية في إقليم شرق المتوسط وتركيا أو تقليله إلى أدنى حد.

References

1. Preventing violence against health workers. Geneva: World Health Organization; 2022 (https://www.who.int/activities/preventing-violence-against-health-workers, accessed 1 April 2023).
2. Violence and harassment. Geneva: World Health Organization; 2022 (https://www.who.int/tools/occupational-hazards-in-health-sector/violence-harassment, accessed 1 April 2023).
3. Liu J, Gan Y, Jiang H, Li L, Dwyer R, Lu K, et al. Prevalence of workplace violence against healthcare workers: a systematic review and meta-analysis. Occup Environ Med. 2019; 76(12):927–37. doi:10.1136/oemed-2019-105849.
4. Framework guidelines for addressing workplace violence in the health sector/Joint Programme on Workplace Violence in the Health Sector. Geneva: International Labour Office, International Council of Nurses, World Health Organization, Public Services International; 2002 (https://apps.who.int/iris/handle/10665/42617, accessed 1 April 2023).
5. Jenkins L. Current intelligence bulletin 57. Violence in the workplace. Risk factors and prevention strategies. Cincinnati: Centers for Disease Control and Prevention/NIOSH; 1996 (Publication No. 96-100; https://www.cdc.gov/niosh/docs/96-100/, accessed 1 April 2023).
6. Li P, Xing K, Qiao H, Fang H, Ma H, Jiao M, et al. Psychological violence against general practitioners and nurses in Chinese township hospitals: incidence and implications. Health Qual Life Outcomes. 2018;16(1):1–10. doi:10.1186/s12955-018-0940-9
7. Xing K, Zhang X, Jiao M, Cui Y, Lu Y, Liu J, et al. Concern about workplace violence and its risk factors in Chinese Township Hospitals: a cross-sectional study. Int. J. Environ. Res. Public Health. 2016;13(8):811. doi:10.3390/ijerph13080811
8. Cetinkaya F, Dur N, Akbulut Z, Korkmaz M. Evaluation of the violence experienced by nurses of different generations and their strategies for coping with the stress resulting from violence. Int J Caring Sci. 2018;11(3):1756–62 (https://internationaljournalofcaringsciences.org/docs/48_centicaya_original_11_3.pdf, accessed 10 April 2023).
9. Work-related violence and its integration into existing surveys. Geneva: International Labour Organization, Department of Statistics; 2013:13. (https://www.ilo.org/public/libdoc//ilo/2013/113B09_220_engl.pdf, accessed 16 November 2022).
10. Lu L, Dong M, Wang S bin, Zhang L, Ng CH, Ungvari GS, et al. Prevalence of workplace violence against health-care professionals in China: a comprehensive meta-analysis of observational surveys. Trauma Violence Abuse. 2020;21(3):498–509. doi:10.1177/1524838018774429
11. Violence: occupational hazards in hospital. Cincinnati: Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 2002 (https://www.cdc.gov/niosh/docs/2002-101/pdfs/2002-101.pdf?id=10.26616/NIOSHPUB2002101, accessed 18 November 2022).
12. Li YL, Li RQ, Qiu D, Xiao SY. Prevalence of workplace physical violence against health care professionals by patients and visitors: a systematic review and meta-analysis. Int J Environ Res Public Health. 2020;17(1):299. doi:10.3390/ijerph17010299

13. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. Updating guidance for reporting systematic reviews: development of the PRISMA 2020 statement. J Clin Epidemiol. 2021 Jun;134:103–12. doi: 10.1016/j.jclinepi.2021.02.003

14. Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. meta-analysis of observational studies in epidemiology (MOOSE) group. JAMA. 2000 Apr 19;283(15):2008–12. doi: 10.1001/jama.283.15.2008

15. Loney PL, Chambers LW, Bennett KJ, Roberts JG, Stratford PW. Critical appraisal of the health research literature: prevalence or incidence of a health problem. Chronic Dis Can, 1998;19(4): 170–6. PMID:10029513

16. 16. Furuya-Kanamori L, Barendregt JJ, Doi SA. A new improved graphical and quantitative method for detecting bias in meta-analysis. Int J Evid Based Healthc. 2018;16(4):195–203. doi:10.1097/XEB.0000000000000141

17. Lin L, Chu H. Quantifying publication bias in meta-analysis. Biometrics. 2018;74(3):785–94. doi:10.1111/biom.12817

18. Huedo-Medina TB, Sánchez-Meca J, Marín-Martínez F, Botella J. Assessing heterogeneity in meta-analysis: Q statistic or I2 index? Psychol Methods. 2006;11(2):193. doi:10.1037/1082-989X.11.2.193

19. Erickson L, Williams-Evans SA. Attitudes of emergency nurses regarding patient assaults. J. Emerg. Nurs. 2000;26(3);210–5. doi:10.1016/S0099-1767(00)90092-8

20. Valentine JC, Pigott TD, Rothstein HR. How many studies do you need? A primer on statistical power for meta-analysis. J Educ Behav Stat. 2010;35(2):215–47. doi:10.3102/1076998609346961

21. Bayram B, Cetin M, Oray NC, Can IO. Workplace violence against physicians in Turkey's emergency departments: a cross-sectional survey. BMJ Open. 2017;7,e013568. doi:10.1136/bmjopen-2016-013568

22. Kitaneh M, Hamdan M. Workplace violence against physicians and nurses in Palestinian public hospitals: a cross-sectional study. BMC Health Serv Res. 2012;12:469. doi:10.1186/1472-6963-12-469

23. Hahn S, Zeller A, Needham I, Kok G, Dassen T, Halfens RJG. Patient and visitor violence in general hospitals: A systematic review of the literature. Aggress Violent Behav. 2008;13(6):431–41. doi:10.1016/j.avb.2008.07.001

24. Nikathil S, Olaussen A, Gocentas RA, Symons E, Mitra B. Workplace violence in the emergency department: A systematic review and meta-analysis. Emerg Med Australas. 2017;29(3):265–75. doi:10.1111/1742-6723.12761

25. D'Ettorre G, Mazzotta M, Pellicani V, Vullo A. Preventing and managing workplace violence against healthcare workers in emergency departments. Acta Biomed. 2018;89(4-S):28–36. doi:10.23750/abm.v89i4-S.7113

26. Aljohani B, Burkholder J, Tran QK, Chen C, Beisenova K, Pourmand A. Workplace violence in the emergency department: a systematic review and meta-analysis. Public Health. 2021;196:186–97. doi:10.1016/j.puhe.2021.02.009

27. Sahebi A, Golitaleb M, Moayedi S, Torres M, Sheikhbardsiri H. Prevalence of workplace violence against health care workers in hospital and pre-hospital settings: an umbrella review of meta-analyses. Front Public Health. 2022;10:895818. doi:10.3389/fpubh.2022.895818

28. Mata DA, Ramos MA, Bansal N, Khan R, Guille C, Di Angelantonio E, et al. Prevalence of depression and depressive symptoms among resident physicians: systematic review and meta-analysis. JAMA. 2015; 314(22):2373–83. doi:10.1001/jama.2015.15845