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Workplace violence against health care workers during the COVID-19 Pandemic: A systematic review and meta-analysis

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ABSTRACT

Introduction: During the COVID-19 pandemic, Health Care Workers (HCWs) have been at the frontline against the disease and have direct contact with patients and their companions, so they are exposed to all sorts of Workplace Violence (WPV). The aim of this study was to investigate the prevalence of WPV against HCWs during the COVID-19 pandemic. *Method:* This study was conducted according to the PRISMA guideline, and its protocol was registered at the PROSPERO under the code of CRD42021285558. Articles were obtained from data resources such as Scopus, PubMed, Web of Science, Science Direct, Google Scholar, and Embase. A literature search was conducted from the beginning of 2020 to the end of December 2021. Meta-analysis was conducted using the Random effects model, and the I^2 index was used to check the heterogeneity. *Results:* In this study, 1,054 articles were initially obtained during the primary search, of which 13 were finally entered in the meta-analysis. According to the results of the meta-analysis, the prevalence of physical and verbal WPV were 10.75% (95% CI: 8.20–13.30, $I^2 = 97.8\%$, $P = 0 < 001$) and 45.87% (95% CI: 36.8–54.93, $I^2 = 99.6\%$, $P = 0 < 001$), respectively. The overall prevalence of WPV was obtained, 45.80% (95% CI: 34.65–56.94, $I^2 = 99.8\%$, $P = 0 < 001$) were reported. *Conclusion:* The results of the present study showed that the prevalence of WPV against HCWs was relatively high during the COVID-19 pandemic; nevertheless, it was lower compared to the area prior to the pandemic. Therefore, HCWs need essential training to reduce stress and increase resilience. Also, considering organizational interventions (including policies to ensure that HCWs report WPV to their supervisors, increasing staffing per patient, and installing systems for HCWs to call for immediate assistance) can increase the resilience HCWs.

1. Introduction

According to the definition by the World Health Organization (WHO), Workplace Violence (WPV) includes work-related threatening, insulting, and harassing of employees, which can also happen when commuting to and from the workplace, and poses evident challenges to their safety and well-being (Fute, Mengesha, Wakgari, & Tessema, 2015; ILO & WHO, 2003). WPV can encompass physical, verbal, and psychological forms (Tee, Özçetin, & Russell-Westhead, 2016) and can occur in any organization, against anyone, and at any time; however, health care workers (HCWs) more frequently experience this phenomenon (Abdellah & Salama, 2017; Anand, Grover, Kumar, Kumar, & Ingle, 2016). According to studies, more than half of HCWs are exposed to some sort of violence, including verbal violence, during their careers (Pinar et al., 2017).

Health care workers are in close contact with patients and their families during health care provision in care centers. On the other hand, patients and their companions, due to their medical situation, drug side effects, or dissatisfaction with the services provided, may exude aggressive and violent behaviors (Al-Turki, Afify, & AlAteeq, 2016). So, HCWs are exposed to WPV due to direct contact with patients (Sheikhbardsiri, Afshar, Baniasadi, & Farokhzadian), which can negatively impact their mental health, leading to absenteeism and compromising health system effectiveness (Sun et al., 2017). Also, WPV against HCWs can ensue several adverse consequences such as anger, anxiety, depression, fear, sleep disturbance,

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job dissatisfaction, and job withdrawal (Lin et al., 2015). The results of a review study in China showed that the prevalence of WPV against HCWs was 62.4%, and the rates of physical, verbal, and psychological violence were 13.7%, 61.2%, and 50.8%, respectively (Lu et al., 2020). The results of a study in the United States that examined workplace violence events reported the rate of physical, non-physical, and physical and non-physical violence as 27%, 27%, and 41%, respectively (Tiesman et al., 2022).

During the COVID-19 pandemic, HCWs fought at the forefront of the war against the disease, exposing themselves to risks such as long working hours, psychological distress, exhaustion, and burnout, as well as severe fear, labeling, and rejection, particularly when providing care to patients with Covid-19 (Rodríguez-Bolaños et al., 2020). Thus, HCWs experienced a variety of psychological consequences during the COVID 19 pandemic (Adibi et al., 2021; Jahangiri & Sahebi, 2020). According to studies, the most common causes of violence against HCWs during the COVID-19 pandemic include mistrust in HCWs, death of COVID-19 patients, hospitals' refusing to admit COVID-19 patients due to limited space, and hospitals' COVID-19 policies (Bhatti, Rauf, Aziz, Martins, & Khan, 2021). The authors found no comprehensive studies addressing the prevalence of WPV against HCWs during the COVID-19 pandemic, so we decided to conduct a systematic review and meta-analysis to investigate the prevalence of this phenomenon during the current pandemic. The results of this study can be beneficial for health managers as an information source for future planning.

2. Materials and methods

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guideline was employed to conduct this systematic review and meta-analysis (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). The protocol of this review was also registered at the International Prospective Register of Systematic Review (PROSPERO) database under the code of CRD42021285558.

3. Search strategy

In this study, a comprehensive search was conducted in valid data resources, including Scopus, PubMed, Web of Science, Science Direct, Google Scholar, and Embase to obtain related studies. Also, other sources such as key journals, conference proceedings, and the reference lists of selected studies were searched to identify relevant studies. Valid English keywords were used, including: "Workplace Violence,*" "Aggression,*" "Harassment,*" "Bullying," "Workplace Bullying," "assault,*" "Abuse," "Physical Abuse," "Violence," "Assaultive Behavior," "Health Care Provider,*" "Health Personnel," "Healthcare Provider,*" "Healthcare Worker,*" "Medical staff," "Medical Worker,*" "Health Care Professional,*" "COVID 19," "COVID 19 Virus Disease,*" "COVID-19 Virus Infection,*" "2019-nCoV Infection,*" "Coronavirus Disease-19," "2019 Novel Coronavirus Disease," "2019 Novel Coronavirus Infection," "2019-nCoV Disease,*" "COVID19," "Coronavirus Disease 2019," "SARS Coronavirus 2 Infection," "SARS-CoV-2 Infection," "SARS CoV 2 Infection,*" "COVID-19 Pandemic.*" In order to compile a search strategy using keywords and operators, a strategy was initially designed in the PubMed database, based on which search strategies in other databases were produced. The searches were conducted in both Persian and English from the beginning of 2020 to the end of December 2021. Search strategies in various databases have been noted in Table 1.

3.1. Inclusion criteria

In this review, the studies reporting the prevalence of various types of WPV against HCWs at work during the COVID-19 pandemic in English were included.

3.2. Exclusion criteria

Review studies, case reports, interventional studies, letters to editors, and studies on WPV against HCWs during periods other than the COVID-19 pandemic were excluded.

3.3. Selection of studies

Initially, all the studies identified in the primary literature search were entered into EndNote 7 software. After removing duplicates, the titles and abstracts of 931 studies were screened. Next, two researchers independently studied the full texts of 22 possibly related studies in detail, and finally, 13 studies were

Table 1
Search Strategy in Various Databases.

Data base	Search strategy
Pubmed	((“Workplace Violence*”[tiab] OR Aggression* OR “Harassment*” OR Bullying OR “Workplace Bullying” OR assault* OR Abuse OR “Physical Abuse” OR Violence OR “Assaultive Behavior”) AND (“Health Care Provider*” OR “Health Personnel”OR “Healthcare Provider*” OR “Healthcare Worker*” OR “Medical staff” OR “Medical Worker*” OR “Health Care Professional*”) AND (COVID 19 OR “COVID 19 Virus Disease*” OR “COVID-19 Virus Infection*” OR “2019-nCoV Infection*” OR “Coronavirus Disease-19” OR “2019 Novel Coronavirus Disease” OR “2019 Novel Coronavirus Infection” OR “2019-nCoV Disease*” OR COVID19 OR “Coronavirus Disease 2019” OR “SARS Coronavirus 2 Infection” OR “SARS-CoV-2 Infection” OR “SARS CoV 2 Infection*” OR “COVID-19 Pandemic*”))
Scopus	((TITLE - ABS (“Workplace Violence*”) OR ALL(Aggression*) OR ALL(“Harassment*”) OR ALL(Bullying) OR ALL(“Workplace Bullying”) OR ALL(Assault*) OR ALL(Abuse) OR ALL(“Physical Abuse”) OR ALL (Violence) OR ALL(“Assaultive Behavior”)) AND (ALL(“Health Care Provider*”) OR ALL(“Health Personnel”) OR ALL(“Healthcare Provider*”) OR ALL(“Healthcare Worker*”) OR ALL(“Medical staff”) OR ALL(“Medical Worker*”) OR ALL(“Health Care Professional*”)) AND (ALL(COVID 19) OR ALL(“COVID 19 Virus Disease*”) OR ALL(“COVID-19 Virus Infection*”) OR ALL(“2019-nCoV Infection*”) OR ALL (“Coronavirus Disease-19”) OR ALL(“2019 Novel Coronavirus Disease”) OR ALL(“2019 Novel Coronavirus Infection”) OR ALL(“2019-nCoV Disease*”) OR ALL(COVID19) OR ALL(“Coronavirus Disease 2019”) OR ALL(“SARS Coronavirus 2 Infection”) OR ALL(“SARS-CoV-2 Infection”) OR ALL(“SARS CoV 2 Infection*”) OR ALL(“COVID-19 Pandemic*”)))
Web Of Science	((TS= (“Workplace Violence*”) OR TS=(Aggression*) OR TS= (“Harassment*”) OR TS= (Bullying) OR TS= (“Workplace Bullying”) OR TS= (Assault*) OR TS= (Abuse) OR TS= (“Physical Abuse”) OR TS= (Violence) OR TS= (“Assaultive Behavior”)) AND (TS= (“Health Care Provider*”) OR TS= (“Health Personnel”) OR TS= (“Healthcare Provider*”) OR TS= (“Healthcare Worker*”) OR TS= (“Medical staff”) OR TS= (“Medical Worker*”) OR TS= (“Health Care Professional*”)) AND (TS= (COVID 19) OR TS= (“COVID 19 Virus Disease*”) OR TS= (“COVID-19 Virus Infection*”) OR TS= (“2019-nCoV Infection*”) OR TS= (“Coronavirus Disease-19”) OR TS= (“2019 Novel Coronavirus Disease”) OR TS= (“2019 Novel Coronavirus Infection”) OR TS= (“2019-nCoV Disease*”) OR TS= (COVID19) OR TS= (“Coronavirus Disease 2019”) OR TS= (“SARS Coronavirus 2 Infection”) OR TS= (“SARS-CoV-2 Infection”) OR TS= (“SARS CoV 2 Infection*”) OR TS= (“COVID-19 Pandemic*”)))

selected for quality assessment. Any disagreement in these steps was resolved by including a third researcher.

3.4. Quality assessment and data extraction

Two of the researchers independently used the Appraisal Tool for Cross-Sectional Studies (AXIS) tool (Downes, Brennan, Williams, & Dean, 2016) to evaluate the quality of the selected studies. The score obtained from this tool ranged between 0 and 20. A score higher than 12 was considered as good quality. Any disagreement between the researchers was resolved through group discussion with a third researcher. Data extraction from the final studies included in the study was independently performed by the two researchers using a pre-prepared checklist, documenting the first author's name, mean age of participants, place of study, sample size, number of males and females, and the prevalence of WPV and its variants. Any disagreement between the two researchers was resolved through discussion with a third investigator.

3.5. Statistical analysis

The simple random effects model was used for meta-analysis. The degree of heterogeneity among the studies was calculated using the I^2 index (indices below 25%, 25–50%, 50–75, and above 75% indicating no heterogeneity, moderate, high, and very high heterogeneity, respectively; Sahebi, Abdi, Moayedi, Torres, & Golitaleb, 2021). Publication bias was assessed utilizing the Egger test. Data were analyzed using STATA software (version 14).

4. Results

In this study, 1,054 articles were initially identified in the primary literature search, and after removing duplicates, 931 studies were screened. Of the studies screened, 22 studies were selected for full-text evaluation, and finally 13 studies were chosen for quality assessment; all of which finally entered the meta-analysis phase (Fig. 1). Based on the quality assessment results, the quality score of the included studies ranged from 14 to 18. In these studies, 31,779 HCWs had been screened in terms of experiencing WPV during the COVID-19 pandemic, of whom 4,987 were male, and 26,792 were female. All the studies selected had a cross-sectional design (Table 2). The results of meta-analysis showed that the rates of physical and verbal WPV were 10.75% (95% CI: 8.20–13.30, $I^2 = 97.8\%$, $P < 0.001$) (Fig. 2) and 45.87% (95% CI: 36.8–54.93, $I^2 = 99.6\%$, $P < 0.001$) (Fig. 3), respectively. The overall prevalence of WPV against HCWs was obtained as 45.80% (95% CI: 34.65–56.94, $I^2 = 99.8\%$, $P < 0.001$) (Fig. 4).

The I^2 index showed that heterogeneity among the studies assessing WPV against HCWs was very high. Based on the results

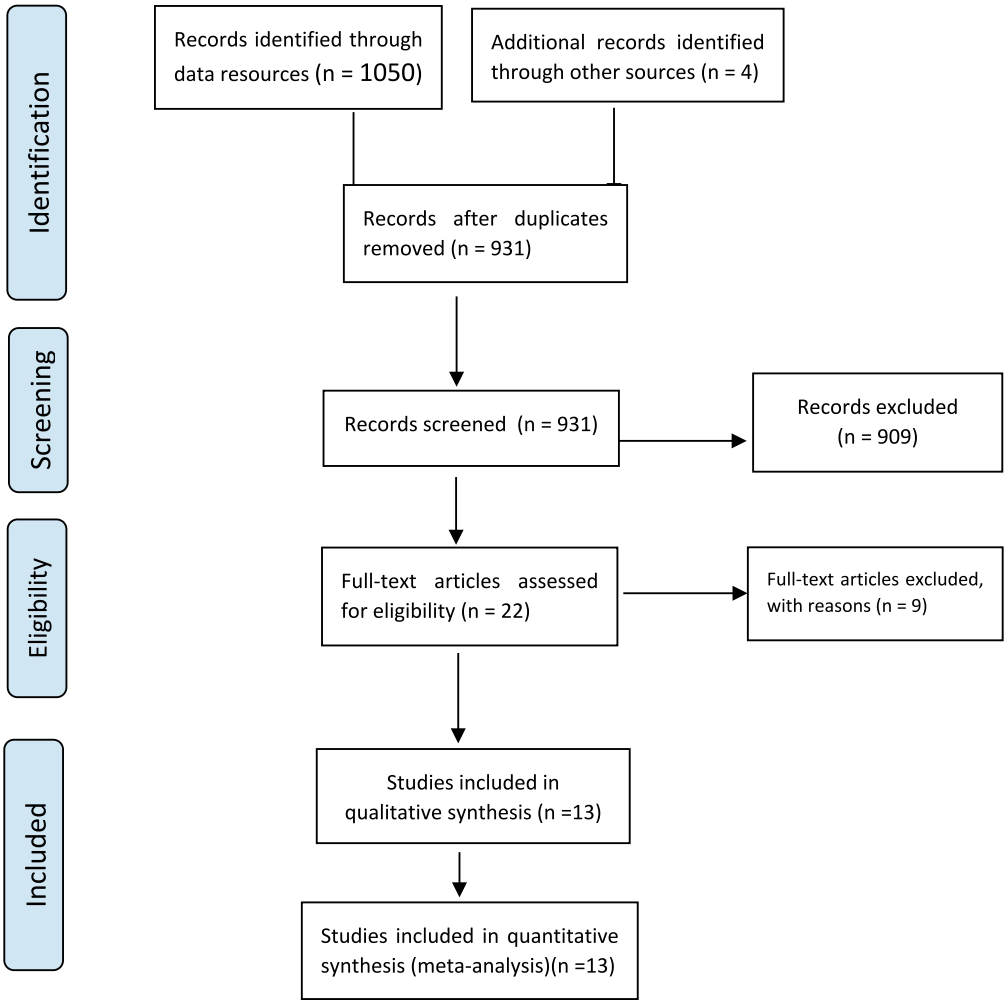

Fig. 1. Flowchart of the Selection of Studies Based on PRISMA.

Table 2
The Specifications of Studies Included in the Meta analysis.

First Author	Location	Sample Size	Male	Female	Physical	Verbal	Total of WPV	Mean age
Yang (Yang et al., 2021)	China	1063	355	708	-	-	20.4%	34.1 ± 7.2
Xie (Xie et al., 2021)	China	10,516	1653	8863	8.4%	15.8%	18.5%	33.2 ± 8.4
Mayta-Tristan (Mayta-Tristan, Alarcón-Yaquetto, & Málaga, 2021)	Peru	200	106	94	0.6%	89.9%	84.5%	37.5
Lafta (Lafta, Qusay, Mary, & Burnham, 2021)	Iraq	505	195	310	-	-	87.3%	-
Ghareeb (Ghareeb, El-Shafei, & Eladl, 2021)	Jordan	382	162	220	16%	52%	65.5%	40.24 ± 11.5
Bitencourt (Bitencourt et al., 2021)	Brazil	1166	288	878	-	-	47.6%	-
Arafa (Arafa, 2021)	Egypt	209	79	130	9.6%	-	-	28.1 ± 6.9
Yang (Yuan Yang et al., 2021)	China	15,531	1770	13,761	6.9%	16.1%	18.5%	33.42
Byon (Byon et al., 2021)	USA	373	21	352	44.4%	67.8%	-	-
Li (Li et al., 2020)	China	1103	102	1001	5.8%	27.5%	29.2%	-
Özkan (Özkan Şat, Akbaş, & Yaman Sözbir, 2021)	Turkey	263	31	232	8.4%	57.8%	-	71.33 ± 15.05
Ghanbari (Ghanbari, Panahi, & Pouy, 2022)	Iran	112	7	105	11.1%	55.7%	-	33.11 ± 5.22
Shaikh (Shaikh, Khan, Baig, Khan, & Arooj)	Pakistan	356	218	138	6.5%	33.1%	41.9%	30.17

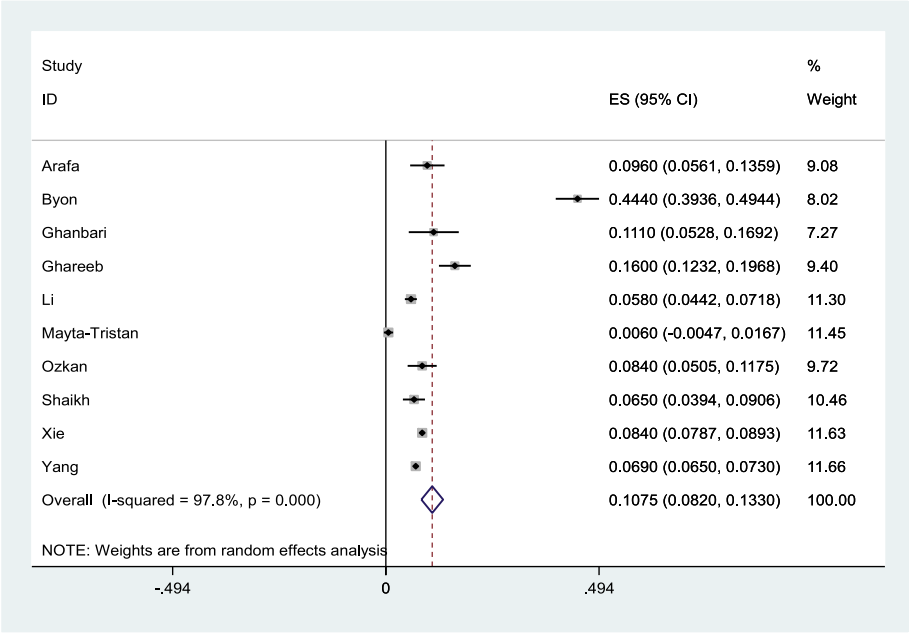

Fig. 2. The Forest Plot of Overall and Individual Prevalence of Physical WPV in the Studies with 95% Confidence Interval.

of the Egger test, publication bias was detected in reporting physical (P = 0.423), verbal (P = 0.004), and overall (P = 0.012) violence at the workplace. Publication bias was significant regarding verbal violence and overall rate of violence, but it was non-significant in terms of physical violence.

5. Discussion

In this review, the prevalence of WPV and its various forms among HCWs during the COVID-19 pandemic were investigated. Thirteen studies were selected for meta-analysis. The results of meta-analysis showed that the overall prevalence of physical and verbal WPV, as well as the overall rate of this phenomenon were 10.75%, 45.87%, and 45.80%, respectively. The results of an umbrella review study showed that the prevalence of WPV against HCWs in hospital and pre-hospital settings was 58.7% (Sahebi, Golitaleb, Moayedi, Torres, & Sheikhbardsiri, 2022). The results of a meta-analysis in 2020 showed that the overall prevalence of WPV against HCWs was 61.9%, and the rates of physical and verbal violence were 24.4% and 57.6%, respectively (Liu et al., 2019). The results of another meta-analysis in 2019 showed that the prevalence of WPV against physicians was 69% (Nowrouzi-Kia, Chai, Usuba, Nowrouzi-Kia, & Casole, 2019). A meta-analysis study in 2018 reported that the overall prevalence of WPV against HCWs in China was 62.4%, with the rates of 13.7% and 61.2% for physical and verbal violence, respectively (Lu et al., 2020). The results of a study by Sahebi *et al.* in Iran indicated that the rates of workplace physical and verbal violence against the personnel of Emergency Medical Services (EMS) were 36.39% and 73.13%, respectively (Sahebi, Jahangiri, Sohrabizadeh, & Golitaleb, 2019). A comparison between our findings and those of other studies highlights a lower average rate of WPV and its various forms during the COVID-19 pandemic than during the time before the pandemic. Thus, it seems that the COVID-19 pandemic has led to a reduction in WPV against HCWs. It should be noted that during the pandemic, health care centers have limitations on the presence of visitors and patient companions in medical wards. Also, the fear of companions contracting the COVID-19 disease contributed to their decreased presence in health centers. Therefore, lower contacts with patient companions can explain the reduction in workplace violence against HCWs during the pandemic.

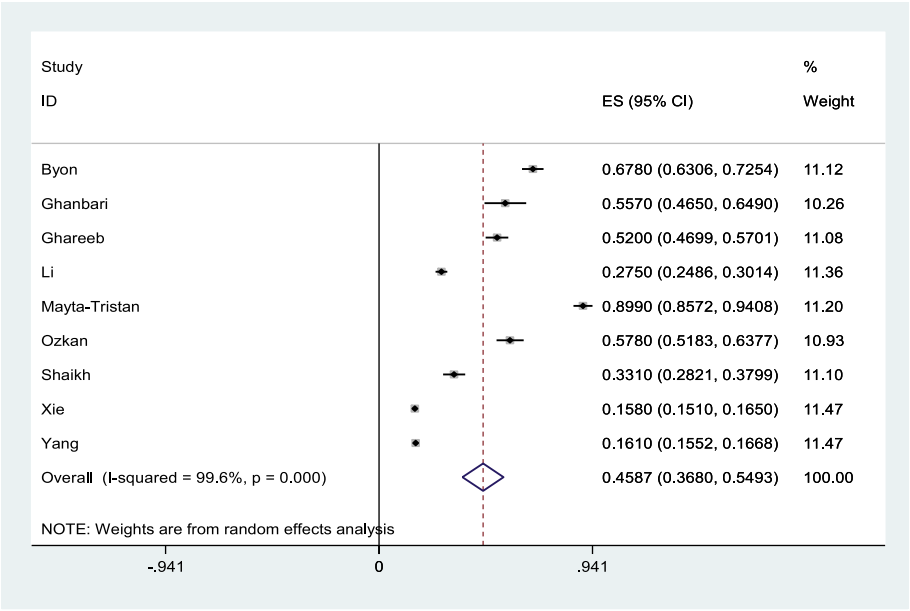

Fig. 3. The Forest Plot of Overall and Individual Prevalence of Verbal WPV in the Studies with 95% Confidence Interval.

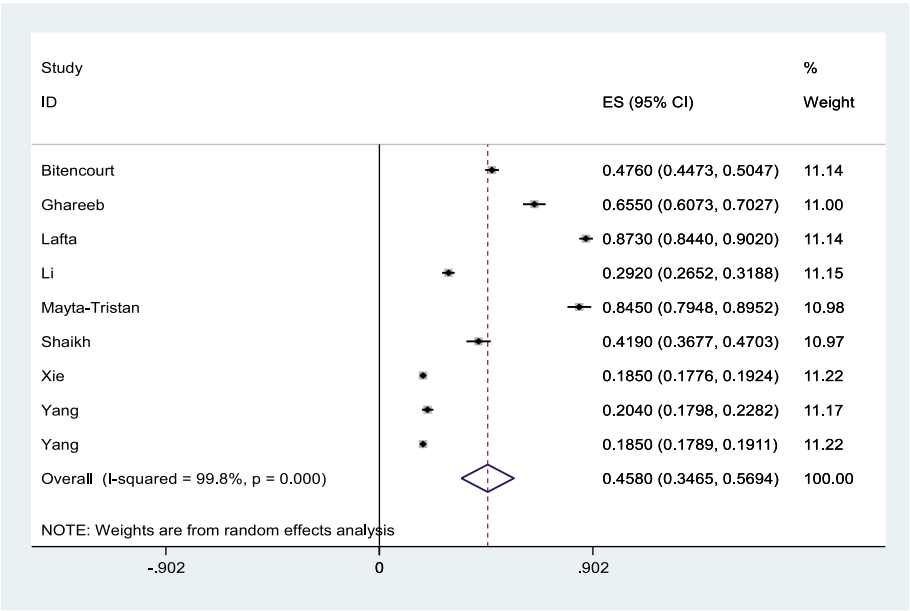

Fig. 4. The Forest Plot of Overall and Individual Prevalence of Overall WVP in the Studies with 95% Confidence Interval.

The results of a study by Abed *et al.* showed that females were more likely to experience WPV than males (Abed, Morris, & Sobers-Grannum, 2016). The results of another study showed that the prevalence of WPV was higher among female nurses than their male peers (Dehghan-Chaloshtari, & Ghodousi, 2020). Consistent with our observations, the results of these studies highlighted the role of gender differences in the incidence of WPV against HCWs. Females generally constitute a higher proportion of employees in health centers, which can justify the higher prevalence of workplace violence against them.

The COVID-19 pandemic has been one of the most stressful recent events globally, leading to numerous social challenges. HCWs were among the first groups to directly face the pandemic, causing them a great deal of anxiety, stress, work burden, and fear of the disease, as well as immense psychological pressure (Di Tella, Romeo, Benfante, & Castelli, 2020). The allocation of health care resources to confine the Covid-19 pandemic has markedly limited the availability and accessibility of health services (Garg, Basu, Rustagi, & Borle, 2020). Other studies have shown that factors such as lack of information, insufficient personnel and equipment, and inadequate communication skills can boost the risk of aggressive behaviors in health care centers (Mento et al., 2020). Based on these studies, it can be concluded that HCWs bear a great amount of psychological pressure during the COVID-19 pandemic. Since the COVID-19 disease is still spreading, it is expected that health care centers, as the forefronts of this war, will face resource shortages. Increased expectations of patients and their companions along with the aforementioned factors can increase the risk of

WPV against HCWs. Therefore, it is recommended that health managers consider physical and mental supportive measures for HCWs and regularly screen them for the signs of psychological disorders.

6. Conclusion

The results of the present study showed that the prevalence of WPV against HCWs was relatively high during the COVID-19 pandemic; nevertheless, it was lower compared to the area prior to the pandemic. Two years have passed since the start of the COVID-19 pandemic, and considering that the disease is still spreading, health care centers, the forefronts of fighting against the disease, are expected to wither in terms of staff and other resources in the long run, which may predispose HCWs to the occurrence of WPV. Therefore, health policymakers should consider full and continuous support for HCWs and regularly screening them for psychological disorders. HCWs should also be provided with ongoing education on coping strategies against stress, anxiety, and anger. Implementing organizational interventions (including policies to ensure that HCWs report WPV to their supervisors, increasing staffing per patient, and installing systems for HCWs to call for immediate assistance) can increase the resilience HCWs.

7. Strengths and limitations

The present review was the first to address the prevalence of WPV against HCWs during the COVID-19 pandemic. One limitation is the lack of separate reporting of WPV against male and female HCWs, which was not addressed by the studies reviewed. Another limitation of this study was the small number of studies included in the search time period.

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