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# Workplace Violence Against Iranian Nurses: A Systematic Review and Meta-Analysis

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Nurses are exposed to workplace violence more than other healthcare professionals. This study aims to examine the prevalence of different types of workplace violence against Iranian nurses. A systematic review and meta-analysis were designed according to the PRISMA statement. To avoid bias, all stages of the research were done independently by two researchers. Eligible studies were retrieved from comprehensive search of several electronic databases included Magiran, Barakat Knowledge Network System, IranDoc, Regional Information Center for Science and Technology (RICST), Scientific Information Database (SID), Iranian National Library, PubMed/Medline, Cochrane Library, Scopus, Science Direct, ISI Web of Knowledge, CINAHL, and Google Scholar until April 2017. A random effects model was applied to combine studies. Data were analyzed using Comprehensive Meta-Analysis software version 2. In 26 studies, 10,858 nurses entered the meta-analysis process. The mean age and work experience of the nurses were 33.5 ± 7.5 and 10.85 ± 10.1 years, respectively. The prevalence of workplace verbal, physical, sexist, and racist violence and threat against Iranian nurses was 80.8% (95% confidence interval [CI] [74.2, 86.0]), 24.8% (95% CI [17.4, 34.0]), 6.7% (95% CI [4.9, 9.2]), 14.6% (95% CI [10.1, 20.7]), and 44% (95% CI [30.1, 58.8]), respectively. The prevalence of verbal and physical violence against the emergency department nurses was 89.7% (95% CI [69.4, 97.1]) and 21.0% (95% CI [12.6, 32.9]), respectively. The highest prevalence of verbal, physical, sexist, and racist violence was from patient's relative (42.3%, 95% CI [30.7, 54.7]), patients (12.6%, 95% CI [5.9, 25.0]), healthcare workers (5.1%, 95% CI [2.4, 10.4]), and patients (2.3%, 95% CI [0.9, 5.4]), respectively. Given the high prevalence of violence against the nurses in Iran, it is highly necessary to take certain intervention measures and design new policies.

**Keywords:** violence; workplace; nurses; Iran; meta-analysis

Violence is an important issue in healthcare and occupational safety. In fact, violence is one of the main causes of death among people aged 15–44 years (Rutherford, Zwi, Grove, & Butchart, 2007). Violence is a behavioral state in which the violent person imposes his/her demands on other people either through physical violence or other forms of violence (Myers, 2014). The World Health Organization (WHO) divides workplace violence into four categories: (1) physical violence (punching, kicking, beating, shouting, pushing, and etc.), (2) verbal violence (insulting, humiliating, swearing, and etc.), (3) racist violence (intimidation because of race, ethnicity, skin color, language, and etc.), and (4) sexist violence (any sexist discrimination which demeans a group; Krug, Dahlberg, Mercy, & Lozano, 2002). According to the National Institute for Occupational Safety and Health, any violent act, including physical assaults and threats of assaults in the workplace, is considered workplace violence (Centers for Disease Control, 2002).

Workplace violence is a serious concern in management. If the workplace becomes vulnerable to violence, the performance of the staff would decrease (Phillips, 2016). According to the WHO, nurses are exposed to workplace violence more than other healthcare staff, and most nurses consider it as the main reason for resigning from their jobs (Krug et al., 2002). Although the whole hospital staff is exposed to violence, the violence against the nurses is much stronger, considering the fact that nurses work in the forefront of healthcare services for the patients and are directly in contact with the relatives of the patients (Lee, Bernstein, Lee, & Nokes, 2014; Potera, 2016).

The International Council of Nurses (ICN) has reported a high rate of death among the nurses because of physical violence (American Nurses Association, 2001). The occurrence of violent acts against the nurses leads to consequences for individuals, organizations, and the society. This problem has negative effects on the personal life of the nurses (Reis et al., 2010) and leads to fatigue (Wolf, Perhats, Delao, & Clark, 2017), burnout (Hsieh, Chen, Wang, Chang, & Ma, 2016), depression (Trudel-Fitzgerald, Chen, Singh, Okereke, & Kubzansky, 2016), the decision to quit nursing or change the workplace (Estryn-Behar et al., 2008), frequent headaches, chronic pain, posttraumatic stress disorder (Wong & Mellor, 2014), stress, low job satisfaction, low job performance, more leave, and higher turnover (Pak, O'Hara, & McCauley, 2008; Wu, Li, & Lin, 2011).

Currently, there is no prevention protocol or an official reporting in Iran about workplace violence in healthcare centers (Mojdeh, Memarzadeh, Abdar Isfahani, & Gholi Pour, 2010).

Therefore, a systematic review of the existing literature and their combination can give us a comprehensive perspective of the problem of violence against the nurses in Iran and facilitate further decisions, budgeting, and planning. This study aims to investigate the prevalence of different types of workplace violence against Iranian nurses.

## METHODS

### Study Protocol

Meta-analysis is a method designed to collect and analyze the data of different studies with a similar objective in order to provide a reliable estimate of the effect of some clinical interventions and observations (Sayehmiri, Abangah, Kalvandi, Tavan, & Aazami, 2018; Sayehmiri, Tavan, Sayehmiri, Mohammadi, & V Carson, 2014; Spector & Thompson, 1991). Obviously, the range of changes and probabilities decreases in meta-analysis studies and the importance of statistical findings increases as we collect the data from several studies with bigger sample size. The special features and methodology of meta-analysis make it more reliable (Badfar et al., 2018; Moher et al., 2010; Spector & Thompson, 1991). Despite different reliable reports, there is no meta-analysis to provide a general estimate.

The present study uses the PRISMA guidelines to carry out a systematic review and meta-analysis of the topic (Moher et al., 2010). To avoid bias, all steps of the research were done independently by two researchers. In case of disagreement, a third researcher intervened to reach an agreement.

### Search Strategy

To find the related literature on the topic, the following databases were searched without any time limit until April 2017: national databases including Magiran (http://www.magiran.com/), Barakat Knowledge Network System (http://health.barakatkns.com), Iranian Research Institute for Information Science and Technology (IranDoc) (https://irandoc.ac.ir), Regional Information Center for Science and Technology (RICST) (http://en.ricest.ac.ir/), Scientific Information Database (SID) (http://www.sid.ir/), Iranian National Library (http://www.nlai.ir/) and international databases including PubMed/Medline, Cochrane Library, Scopus, Science Direct, ISI Web of Knowledge, CINAHL and Google Scholar search engine. In addition, a manual search was done on the references of all

related articles. The English MeSH keywords and their Persian equivalents were used, including "Violence" [MeSH], "Workplace" [MeSH], "Workplace Violence" [MeSH], "Occupational Exposure" [MeSH], "Nurses" [MeSH], "Personnel," "Epidemiology" [MeSH], "Prevalence" [MeSH], "Aggression" [MeSH], and "Iran" [MeSH]. In addition, "AND" & "OR" were used to combine keywords. A search sample on PubMed is presented in the Appendix.

## Inclusion and Exclusion Criteria

Inclusion criteria were determined regarding PICO (related to Evidence-Based Medicine) (19) (1) Population: Cross-sectional studies that assessed violence against the nurses employed in hospitals; (2) Intervention: WHO or Non-WHO questionnaires that confirmed violence; (3) Comparison: That can show the violence prevalence in terms of genders, offenders, region, province, and questionnaire; (4) Outcome: Estimating the prevalence of violence against Iranian nurses.The included articles were studies that contained any discussion related to violence against the nurses employed in hospitals in Iran. The exclusion criteria were as follows: (a) non-Iranian sample, (b) nonrandom sample; (c) irrelevance; (d) focus on staff other than nurses, (e) assessment of workplace violence over the past year, (f) duplicate studies, (g) review studies, case reports, and editorials without original data, and (h) low-quality studies.

## Definition

The prevalence of violence was defined as the proportion of nurses experiencing violence over the past year.

## Participants in the Study

Nurses working in Iranian hospitals with at least 1 year of work experience participated in this study. Iran is a Muslim country with 31 provinces located in the Middle East. Iranian Ethnic groups based on Atlas Narodov Mira include Indo-European family (Persian, Kurdish, Gilaki, Mazandarani, Balluchi, Talashi, Tati, etc.), Turkish family (Azeri, Turkmeni, Qashqai, etc.), Semitic family (Arabic) and and so on, currently united by Iranian culture (Figure 1).

## The Quality of the Studies

To examine the quality of the studies, the modified Newcastle Ottawa Scale (NOS) for cross-sectional studies checklist was used (Wells et al., 2011). Qualitative evaluation of the collected data was conducted by two professional researchers. A group discussion finalized the score in cases of disagreements; that is, if there were differences between the scores given to each study by the two researchers. Scores <5 indicate low quality, 5–6 indicate medium quality, and 7–28 indicate high quality. In the end, articles with a minimum score of 5 were chosen for meta-analysis. Although each article was evaluated in terms of quality, the score for quality was not included in the main weight of meta-analysis.

## Data Collection

The data collection form was constructed by the researchers in advance. The form included information about the name of the author(s), year of study, year of publication, study

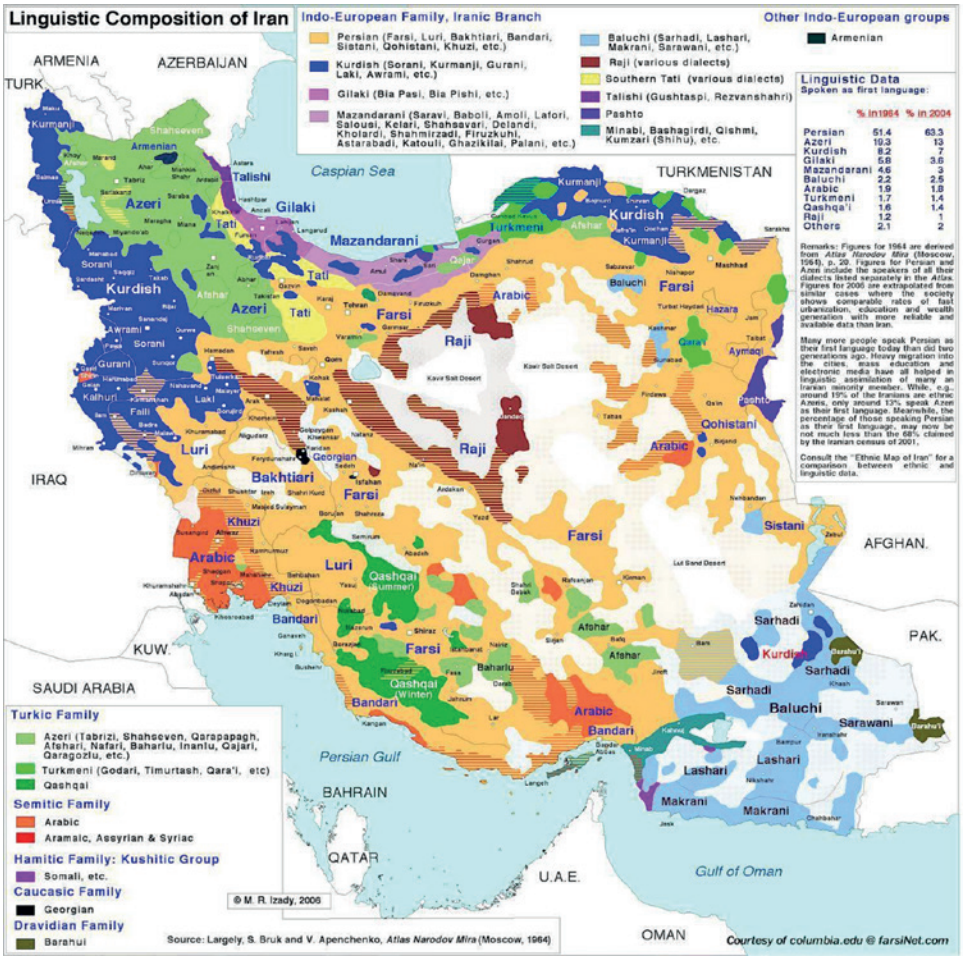


**FIGURE 1.** Linguistic and familial composition of Iran.

design, quality score, location, the prevalence of violence (physical, verbal, sexist, racist violence, threat etc), the prevalence of violence among genders, and the prevalence of violence in terms of different offenders (patients, patient's relatives, or healthcare workers).

## Statistical Analysis

To evaluate the heterogeneity of the studies, we used the Cochran's $Q$ test and $I^2$ statistic. There are three categories for the $I^2$ statistic: $I^2$ less than 25% = low incongruity, 25%–75% = medium, more than 75% = high incongruity. Because of the significant rate of heterogeneity between studies, a random effects model was used in the meta-analysis (Ades, Lu, & Higgins, 2005; Borenstein, Hedges, Higgins, & Rothstein, 2010). To find the source of heterogeneity, subgroup analysis was conducted based on geographic region, provinces, and questionnaires, and a meta-regression model was used for investigating the prevalence of verbal and physical violence based on the year of the studies. Sensitivity analysis was conducted to assess the influence of each study on the pooled estimate. Begg

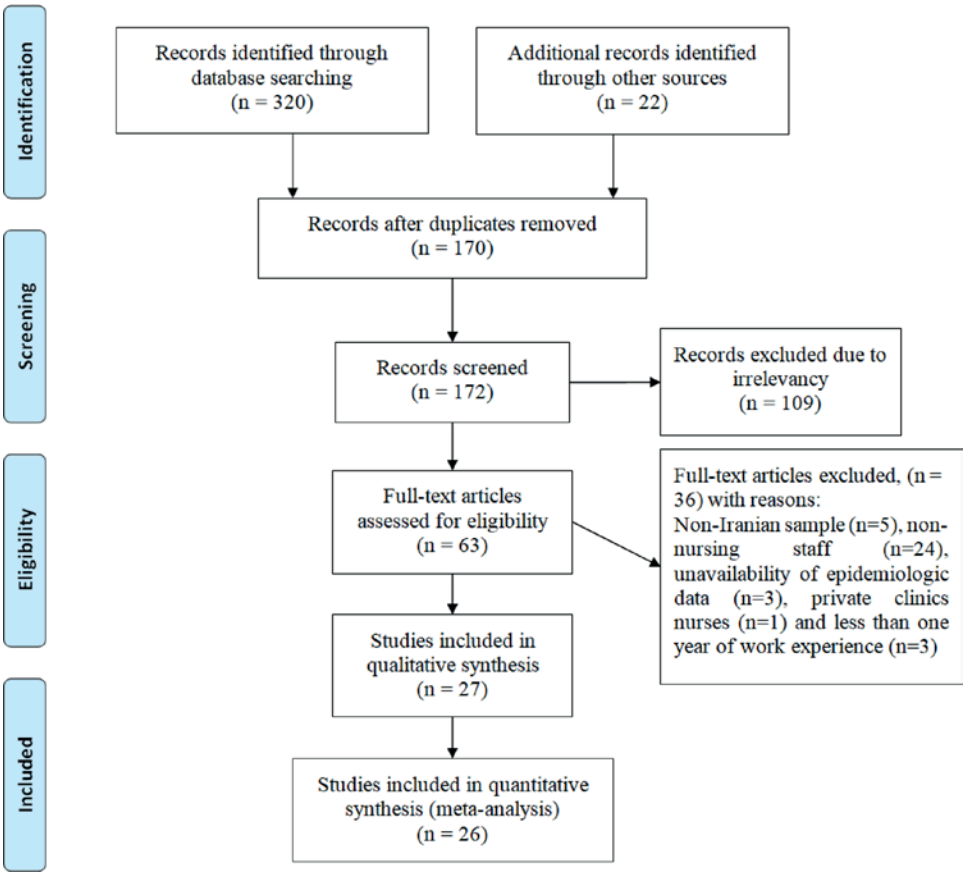


**FIGURE 2.** PRISMA flowchart of literature search.

and Egger's tests were used to assess publications bias. The data were analyzed using the Comprehensive Meta-Analysis Software Version 2. $P < .05$ was considered significant.

## RESULTS

### Selection of the Studies

The systematic search was conducted independently by two researchers, who were fully familiar with search engines. First, 342 related articles were found. The two researchers examined the titles and abstracts of the articles independently. Then, 170 articles were excluded because of having duplicate topics, and 109 articles were excluded because of being irrelevant. The full text of the remaining articles was reviewed for their relevance to the topic. After examining the full text of 63 articles, 36 articles were excluded for the following reasons: non-Iranian sample ($n = 5$), nonnursing staff ($n = 24$), unavailability of epidemiologic data ($n = 3$), private clinics nurses ($n = 1$), and work experience less than 1 year ($n = 3$). In the end, 26 articles were selected for qualitative evaluation (Figure 2).

## Characteristics of the Included Studies

In the 26 studies, 10,858 nurses were analyzed. The mean age and working experience of the sample were 33.5 ± 7.5 and 10.85 ± 10.1 years, respectively. The details of these studies are presented in Table 1.

## Workplace Verbal Violence

The prevalence of workplace verbal violence against the nurses in Iran was estimated to be 80.8% (95% confidence interval [CI] [74.2, 86.0]), and the heterogeneity was ($I^2$ = 97.76%, $p < .001$; Figure 3A). The lowest prevalence of verbal violence was in a study conducted in Tabriz in 2013 (25%). The highest prevalence of verbal violence was reported in a study in Mashhad in 2012 (100%).

The sensitivity analysis for the prevalence of verbal violence shows that the results are robust (Figure 4A).

The prevalence of verbal violence against the emergency department nurses was estimated to be 89.7% (95% CI [69.4, 97.1]; Figure 5A).

The lowest and highest prevalence of verbal violence was in the South (74.0%, 95% CI [67.3, 76.7]) and the East of Iran (99.3%, 95% CI [89.5, 100]), respectively, and subgroup difference was significant ($p < .001$; Table 2). The highest prevalence of verbal violence against nurses was in Khorasan Razavi (99.3%), Hamedan (96%), and West Azerbaijan (92.5%) provinces, and subgroup difference was significant ($p < .001$; Table 2 and Figure 6A).

The prevalence of verbal violence according to the WHO and non-WHO questionnaires was 81.4% (95% CI [72.2, 88.1]) and 77% (95%CI: 67.4–86.5), respectively, and subgroup difference was not significant ($p = .757$; Table 2).

The lowest and highest prevalence of verbal violence against the nurses in terms of the aggressors was from the healthcare workers (10.3%, 95% CI [6.5, 15.8]) and patient's relative (42.3%, 95% CI [30.7, 54.7]), respectively (Table 3).

The prevalence of verbal violence against the nurses in Iran according to year of the study based on meta-regression model was not significant (meta-regression coefficient: −0.055, 95% CI [−0.203, 0.093], $p = .465$; Figure 7A).

## Workplace Physical Violence

The prevalence of workplace physical violence against the nurses in Iran was estimated to be 24.8% (95% CI [17.4, 34.0]), and heterogeneity was ($I^2$ = 97.47%, $p < .001$; Figure 3B). The lowest and highest prevalence were reported in Tehran in 2009 (2.6%) and 2011 (71.6%), respectively.

The sensitivity analysis for the prevalence of physical violence against nurses in Figure 4B shows that the results are robust.

The prevalence of physical violence against the emergency department nurses was estimated to be 21.0% (95% CI [12.6, 32.9]; Figure 5B).

The prevalence of physical violence against Iranian nurses in North, South, Center, East, and West was 24.6%, 43.8%, 24.8%, 22.1%, and 21.0%, respectively, and subgroup difference was significant ($p = .002$; Table 2). The lowest and highest prevalence of physical violence against nurses was in the provinces of Isfahan (9.1%) and Chaharmahal and Bakhtiari (56.7%), respectively, and subgroup difference was significant ($p < .001$; Table 2 and Figure 6B).

**TABLE 1. Study Characteristics of 26 Studies on Workplace Violence Against Iranian Nurses**

| Reference | Place | Year | Sample Size | Women | Men | Average Age | Average Work Experience | Questionnaire | Prevalence of Violence (%) | | Quality Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Verbal | Physical | |
| (Imani, Nazari, Majidi, Zandieh, & Taajobi, 2014) | Hamedan | 2012 | 52 | 31 | 21 | | | WHO | 96 | 15.4 | 6 |
| (Zamanzadeh, Solimannezhad, & Abdollahzadeh, 2006) | East Azarbaijan | 2004 | 468 | 161 | 307 | 35.43 ± 7.97 | 7.95 ± 10.1 | WHO | 72.1 | 46.15 | 6 |
| (Salimi, Ezazi Erdi, & Karbakhsh Davari, 2007) | Tehran | 2004 | 136 | 91 | 45 | 33.8 ± 6.9 | | Non-WHO | 97.8 | 39.7 | 5 |
| (Aghilinejad, Nojomi, & Seyed Mehdi, 2011) | Tehran | 2009 | 1070 | | | 34.19 ± 8.3 | 9.54 ± 7.63 | Non-WHO | | 2.6 | 6 |
| (Soheili et al., 2014) | Orumieh | 2013 | 120 | 77 | 43 | 33.12 ± 6.4 | | Non-WHO | 92.5 | 34.2 | 7 |
| (Moraveji, Soleimannejad, & Bazargan, 2010) | Zanjan | 2008 | 190 | | | 30.0 ± 5.26 | 6 ± 6.32 | Non-WHO | 77.77 | 40.54 | 7 |
| (Dehnadi-Moghaddam et al., 2012) | Rasht | 2010 | 138 | 120 | 18 | 31.83 ± 7.7 | 7.09 ± 6.14 | Non-WHO | 58.64 | 11.11 | 7 |
| (Mozafari & Tavan, 2013) | Ilam | 2011 | 147 | 63 | 84 | | | Non-WHO | | | 6 |
| (Babayi et al., 2014) | Tabriz | 2013 | 376 | 223 | 153 | | | WHO | 25 | 4.3 | 5 |
| (Paryad et al., 2015) | Rasht | 2012 | 442 | | | 32.11 ± 6.1 | 7.61 ± 5.36 | Non-WHO | 54.1 | 11.1 | 5 |
| (Yazdi, Barikani, & Nourizadeh, 2016) | Qazvin | 2015 | 300 | 106 | | | | | 45 | 25 | 5 |

*(Continued)*

**TABLE 1. Study Characteristics of 26 Studies on Workplace Violence Against Iranian Nurses (*Continued*)**

| Reference | Place | Year | Sample Size | Women | Men | Average Age | Average Work Experience | Questionnaire | Prevalence of Violence (%) | | Quality Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Verbal | Physical | |
| (Heydarikhayat, Mohammadinia, Sharifipour, & Almasy, 2012) | Zahedan | 2011 | 145 | 101 | 44 | 29.6 ± 6.05 | | WHO | 84.4 | | 6 |
| (Aivazi, Menati, Tavan, Navkhasi, & Mehrdadi, 2017), (Aivazi & Tavan, 2015) | Ilam | 2012 | 106 | | | | | Non-WHO | 90.5 | 15.1 | 6 |
| (Fallahi Khoshknab, Tamizi, & Ghazanfari, 2013) | Tehran | 2011 | 183 | 74 | 109 | 36.15 ± 6.5 | 11.78 ± 5.6 | WHO | | 71.6 | 8 |
| (Ghasemi & Rezaei, 2007) | Tehran | 2006 | 450 | 228 | 222 | 38.0 ± 3.2 | | WHO | | 21.3 | 6 |
| (Dehghan-Chaloshtari & Ghodousi, 2017) | Shahrekord | 2014 | 97 | 76 | 24 | 35.6 ± 11.24 | 9.87 ± 10.03 | WHO | 83.5 | 56.7 | 7 |
| (Salavati, Daraie, Tabesh, Aradoi, & Salavati, 2015) | Ahvaz | 2011 | 192 | 144 | 48 | | | WHO | 74 | 43.8 | 5 |
| (HosseinAbadi, Biranvand, Anbari, & Heidari, 2013) | Khoramabad | 2011 | 423 | 351 | 72 | 31.4 ± 7.4 | 8.07 ± 6.90 | WHO | | | 6 |
| (Rafati Rahimzadeh, Zabihi, & Hosseini, 2011) | Babol | 2009 | 302 | 241 | 61 | | | WHO | 82.45 | 22.97 | 5 |
| (Esmaeili, Nabavi, & Reihani, 2015) | Mashhad | 2012 | 68 | 58 | 10 | | 28.78 ± 4.1 | WHO | 100 | 22.05 | 6 |

**TABLE 1. Study Characteristics of 26 Studies on Workplace Violence Against Iranian Nurses (*Continued*)**

| Reference | Place | Year | Sample Size | Women | Men | Average Age | Average Work Experience | Questionnaire | Prevalence of Violence (%) | | Quality Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Verbal | Physical | |
| (Teymourzadeh, Rashidian, Arab, Akbari-Sari, & Hakimzadeh, 2014) | Tehran | 2010 | 301 | | | | | WHO | 64 | 12 | 5 |
| (Esmaeilpour, Salsali, & Ahmadi, 2011) | Tehran | 2008 | 196 | 174 | 22 | | | WHO | 91.6 | 19.7 | 6 |
| (Khademloo, Moonesi, & Gholizade, 2013) | Sari | 2012 | 271 | 193 | 78 | 36.8 ± 9.35 | | WHO | 95.9 | 29.15 | 5 |
| (Fallahi Khoshknab et al., 2015) | Tehran | 2011 | 4505 | | | | | WHO | 80.7 | | 6 |
| (Eslamian, Akbarpoor, & Hoseini, 2015) | Isfahan | 2012 | 36 | | | 33.76 ± 7.13 | | Non-WHO | 44.1 | 9.1 | 6 |
| (Rahmani, Ebrahimi, & Asghari, 2015) | Tabriz | 2014 | 144 | 63 | 81 | 36.00 ± 8.60 | | WHO | 96.5 | 83.3 | 6 |

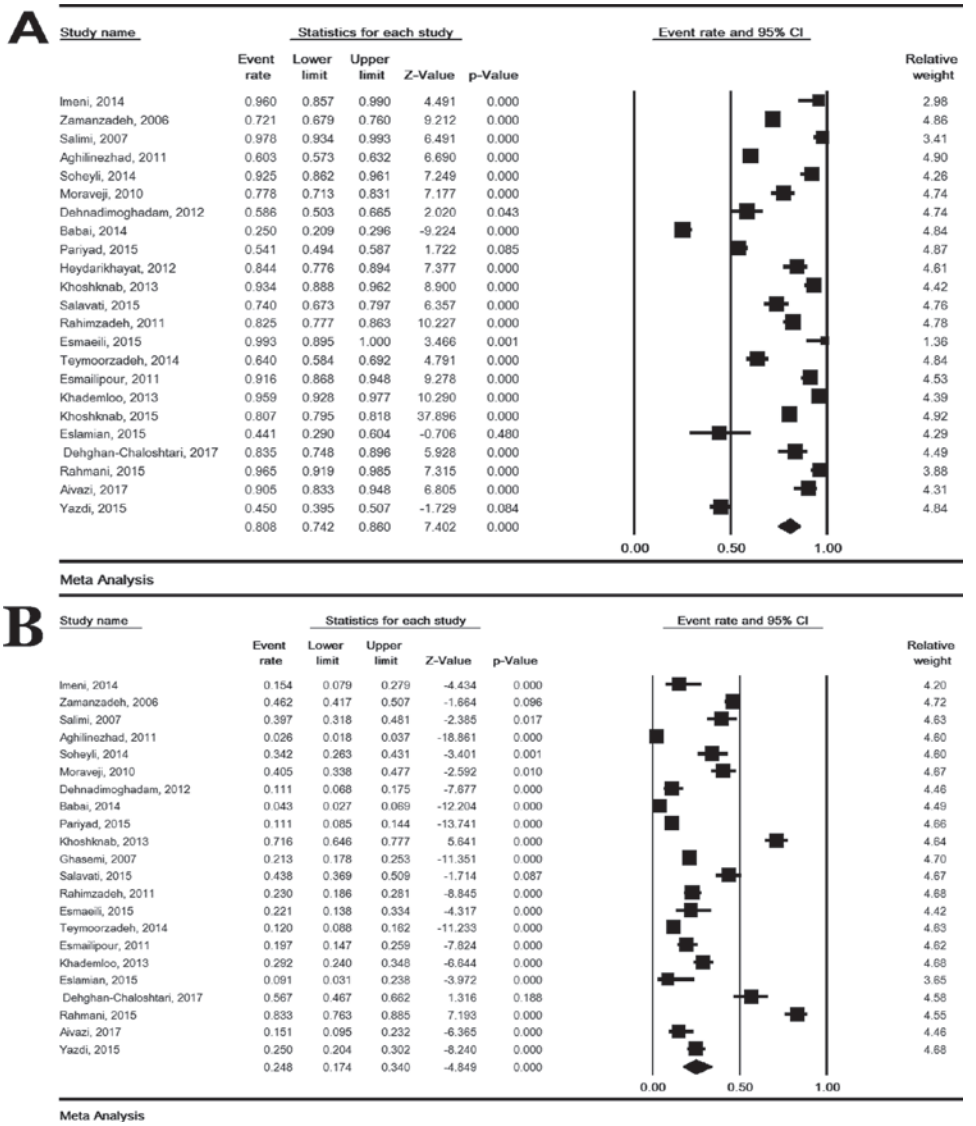


**FIGURE 3.** Meta-analysis of the prevalence of workplace verbal (A) and physical (B) violence against the nurses in Iran. Random effects model. CI = confidence interval.

The prevalence of physical violence according to the WHO and non-WHO questionnaires was 26.3% (95% CI [18.5, 43.0]) and 18.6% (95% CI [9.6, 33.0]), respectively, and subgroup differences were not significant ($p$ = .232; Table 2).

The lowest and highest prevalence of physical violence against the nurses in terms of the aggressors were from the healthcare workers (1.4%, 95% CI [0.7, 3.0]) and the patients (12.6%, 95% CI [5.9, 5.0]), respectively (Table 3).

The prevalence of physical violence against the nurses in Iran according to year of the study based on meta-regression model was not significant (meta-regression coefficient: 0.006, 95% CI [–0.153, 0.166], $p$ = .935; Figure 7B).

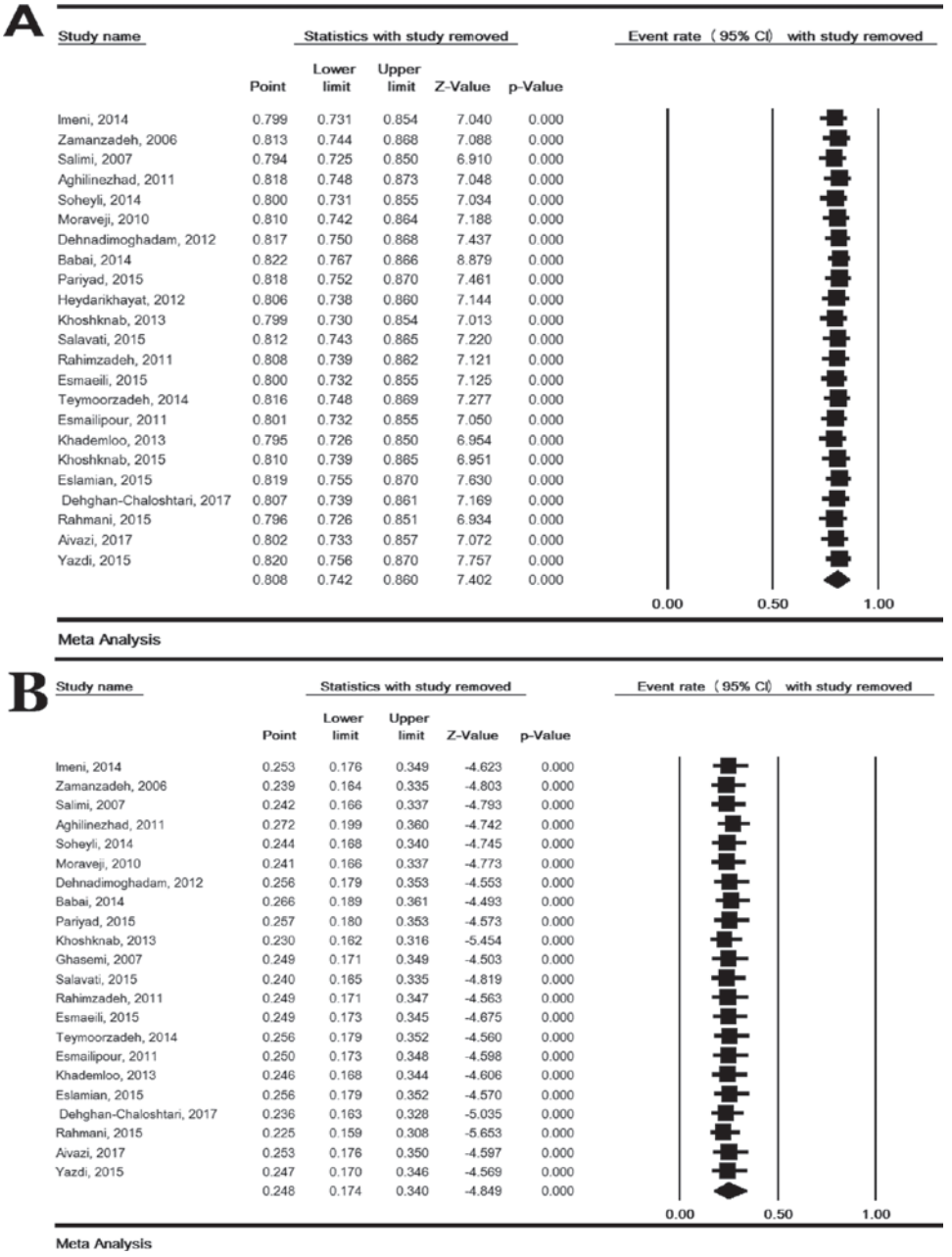


**FIGURE 4.** Sensitivity analysis of the prevalence of workplace verbal (A) and physical (B) violence against the nurses in Iran. Random effects model. CI = confidence interval.

## Workplace Racist Violence

The prevalence of racist violence against the nurses in Iran was estimated to be 14.6% (95% CI [10.1, 20.7]), and the heterogeneity was ($I^2$ = 89.06%, $p$ = .076; Figure 8A).

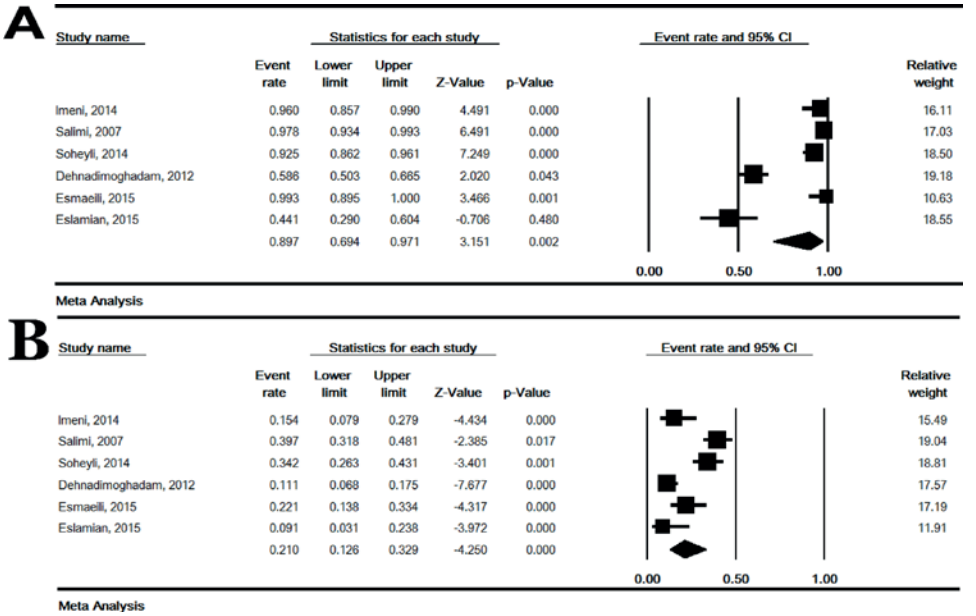


**FIGURE 5.** Meta-analysis of the prevalence of workplace verbal (A) and physical (B) violence against the emergency department nurses in Iran. Random effects model. CI = confidence interval.

The sensitivity analysis for the prevalence of sexist violence against nurses shows that the results are robust (Figure 9-A).

The lowest prevalence of racist violence against the nurses in terms of the aggressors was from the patient's relatives (3.4%, 95% CI [1.8, 6.5]), and the highest prevalence of racist violence was from the healthcare workers (5.1%, 95% CI [2.4, 10.4]), respectively (Table 3).

The prevalence of racist violence against the nurses in Iran according to year of the study based on meta-regression model was not significant (meta-regression coefficient: –0.054, 95% CI [–0.179, 0.071], $p = .399$; Figure 10A).

## Workplace Sexist Violence

The prevalence of sexist violence and threat against the nurses in Iran was estimated to be 6.7% (95% CI [4.9, 9.2]), and the heterogeneity was ($I^2 = 47.43\%$, $p < .001$; Figure 8B).

The sensitivity analysis for the prevalence of sexist violence against nurses in shows that the results are robust (Figure 9B).

The lowest prevalence of sexist violence against the nurses in terms of the aggressors was from the healthcare workers (1.3%, 95% CI [0.3, 5.2]), and the highest prevalence of racist violence was from the patients (2.3%, 95% CI [0.9, 5.4]), respectively (Table 3).

The prevalence of sexist violence against the nurses in Iran according to year of the study based on meta-regression model was not significant (meta-regression coefficient: –0.065, 95% CI [–0.140, 0.009], $p = .084$; Figure 10B).

**TABLE 2. Meta-Analysis of the Prevalence of Workplace Verbal and Physical Violence Against the Nurses in Iran Based on Regions, Provinces, and Questionnaire**

| | | Workplace Verbal Violence | | | | Workplace Physical Violence | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ |
| Regions | North | 7 | 2,141 | 75.8 [57.2, 88.0] | 98.38 | 7 | 2,141 | 24.6 [11.9, 44.0] | 98.28 |
| | South | 1 | 192 | 74.0 [67.3, 76.7] | 0 | 1 | 192 | 43.8 [36.9, 50.9] | 0 |
| | Center | 11 | 7,159 | 78.8 [69.7, 85.7] | 97.73 | 10 | 2,959 | 24.8 [13.6, 40.7] | 97.95 |
| | East | 3 | 68 | 99.3 [89.5, 100] | 0 | 1 | 68 | 22.1 [13.8, 33.4] | 0 |
| | West | 3 | 278 | 92.1 [88.2, 94.8] | 0 | 3 | 278 | 21.0 [10.7, 37.0] | 84.80 |
| | Subgroup differences | Test for subgroup differences: $Q = .096$, $df(Q) = 1$, $p = .757$ | | | | Test for subgroup differences: $Q = 17.310$, $df(Q) = 4$, $p = .002$ | | | |

*(Continued)*

**TABLE 2. Meta-Analysis of the Prevalence of Workplace Verbal and Physical Violence Against the Nurses in Iran Based on Regions, Provinces, and Questionnaire (*Continued*)**

| | | Workplace Verbal Violence | | | | Workplace Physical Violence | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ |
| Provinces | Khuzestan | 1 | 192 | 74.0 [67.3, 76.7] | 0 | 1 | 192 | 24.0 [16.5, 33.5] | 0 |
| | Mazandaran | 2 | 573 | 91.1 [68.0, 98.0] | 95.47 | 2 | 573 | 26.0 [20.4, 32.5] | 64.69 |
| | East Azarbaijan | 3 | 998 | 73.1 [30.9, 94.3] | 99.08 | 3 | 998 | 36.7 [6.8, 82.2] | 98.97 |
| | Hamedan | 1 | 52 | 96.0 [85.7, 99.0] | 0 | 1 | 52 | 15.4 [7.9, 27.9] | 0 |
| | Ilam | 1 | 106 | 90.5 [83.3, 94.8] | 0 | 1 | 106 | 15.1 [9.5, 23.2] | 0 |
| | Isfahan | 1 | 36 | 44.1 [29.0, 60.4] | 0 | 1 | 36 | 9.1 [3.1, 23.8] | 0 |
| | Khorasan Razavi | 1 | 68 | 99.3 [89.5, 100] | 0 | 1 | 68 | 22.1 [13.8, 33.4] | 0 |
| | West Azarbaijan | 1 | 120 | 92.5 [86.2, 96.1] | 0 | 1 | 120 | 34.2 [26.3, 43.1] | 0 |
| | Qazvin | 1 | 300 | 74.0 [67.3, 79.7] | 0 | 1 | 300 | 25.0 [20.4, 30.2] | 0 |
| | Guilan | 2 | 580 | 55.2 [51.1, 59.2] | 0 | 2 | 580 | 11.1 [8.8, 13.9] | 0 |
| | Chaharmahal and Bakhtiari | 1 | 97 | 83.5 [74.8, 89.6] | 0 | 1 | 97 | 56.7 [46.7, 66.2] | 0 |
| | Tehran | 6 | 6,391 | 84.7 [74.9, 91.2] | 98.24 | 6 | 6,391 | 21.4 [8.2, 45.4] | 98.64 |
| | Sistan and Baluchestan | 1 | 145 | 84.4 [77.6, 89.4] | 0 | - | - | - | - |
| | Zanjan | 1 | 190 | 77.8 [71.3, 83.1] | 0 | 1 | 190 | 40.5 [33.8, 47.7] | |
| | Test for subgroup differences: $Q = 228.836$, $df(Q) = 13$, $p < .001$ | | | | | Test for subgroup differences: $Q = 169.548$, $df(Q)=12$, $p < .001$ | | | |

**TABLE 2. Meta-Analysis of the Prevalence of Workplace Verbal and Physical Violence Against the Nurses in Iran Based on Regions, Provinces, and Questionnaire (*Continued*)**

| | | Workplace Verbal Violence | | | | Workplace Physical Violence | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ |
| Questionnaire | WHO | 14 | 7,065 | 81.4 [72.2, 88.1] | 97.66 | 13 | 2,865 | 29.3 [18.5, 43.0] | 97.54 |
| | Non-WHO | 8 | 2,473 | 77 (67.4–86.5) | 95 | 8 | 2,473 | 18.6 [9.6, 33] | 97.39 |
| | Subgroup differences | Test for subgroup differences: $Q = .096$, $df(Q) = 1$, $p = .757$ | | | | Test for subgroup differences: $Q = 1.420$, $df(Q) = 1$, $p = .232$ | | | |

*Note*. *N* = number; CI = confidence interval.

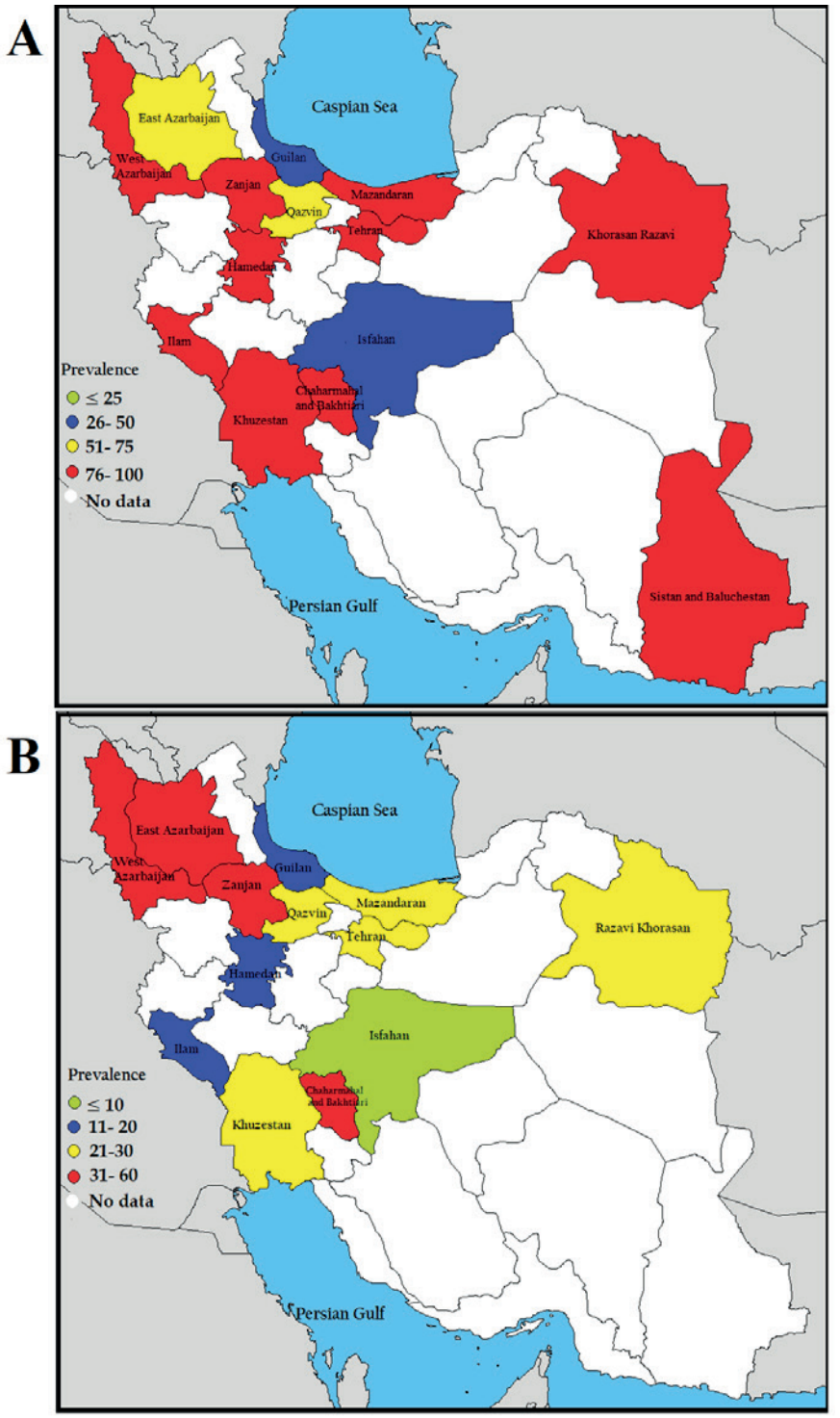


**FIGURE 6.** Distribution of workplace verbal (A) and physical (B) violence in Iran.

**TABLE 3. Prevalence of Violence Against Nurses Based on Aggressors**

| Violence | Aggressors | Studies, *N* | Sample, *N* | Overall (95% CI) (%) | $I^2$ (%) |
|---|---|---|---|---|---|
| Verbal | From the patients | 11 | 2,674 | 17.8 [13.7, 22.8] | 88.69 |
| | From the patient's relatives | 11 | 2,674 | 42.3 [30.7, 54.7] | 97.01 |
| | From the healthcare workers | 10 | 2,554 | 10.3 [6.5, 15.8] | 92.83 |
| Physical | From the patients | 12 | 2,864 | 12.6 [5.9, 25.0] | 97.82 |
| | From the patient's relatives | 12 | 2,864 | 12.3 [8.2, 17.9] | 92.60 |
| | From the healthcare workers | 10 | 2,548 | 1.4 [0.7, 3.0] | 76.77 |
| Racist | From the patients | 4 | 1,217 | 4.1 [1.6, 10.3] | 90.77 |
| | From the patient's relatives | 4 | 1,217 | 3.4 [1.8, 6.5] | 74.51 |
| | From the healthcare workers | 4 | 1,217 | 5.1 [2.4, 10.4] | 87.51 |
| Sexist | From the patients | 5 | 1,314 | 2.3 [0.9, 5.4] | 80.38 |
| | From the patient's relatives | 4 | 1,131 | 2.3 [1.6, 3.4] | 0 |
| | From the healthcare workers | 4 | 1,131 | 1.3 [0.3, 5.2] | 80.10 |

*Note*. *N* = number; CI = confidence interval.

### Workplace Threat

The prevalence of threat against the nurses in Iran was estimated to be 44% (95% CI [30.1, 58.8]), respectively (Figure 8C).

### Publication Bias

The publication bias was also evaluated by Begg and Egger's tests and was estimated not significantly in all aspects of violence in this research ($P > 0.05$).

## DISCUSSION

The violence against healthcare personnel is increasing (Groenewold et al., 2018). It has become an alarming problem in the developed and developing countries (Gates, Gillespie, & Succop, 2011). Since the nurses are on the forefront of healthcare services, they are exposed to occupational violence more than others (Esmaeilpour et al., 2011; Shoghi et al., 2008). It is important to note that 70%–80% of the violent acts are not reported because the nurses consider them as part of their jobs (Gates et al., 2011).

In this study, 26 studies with the sample size of 10,858 nurses entered the meta-analysis process. Because of the heterogeneity of the studies, a random effects model was used for combining the data. Then, violence was analyzed in terms of geographical region, type of questionnaire, date of study, and type of violence of the aggressors.

Verbal violence among Iranian nurses over 1 year experience is reported to be 81.5%. In addition, the prevalence of verbal violence in other countries was reported to be 39%–98.5% over 1 year experience (Al-Omari, 2015; Duncan, Estabrooks, & Reimer, 2000; Senuzun Ergün & Karadakovan, 2005). Some influential factors include the type of the questionnaire, type of clinical workplace, and prevention measures.

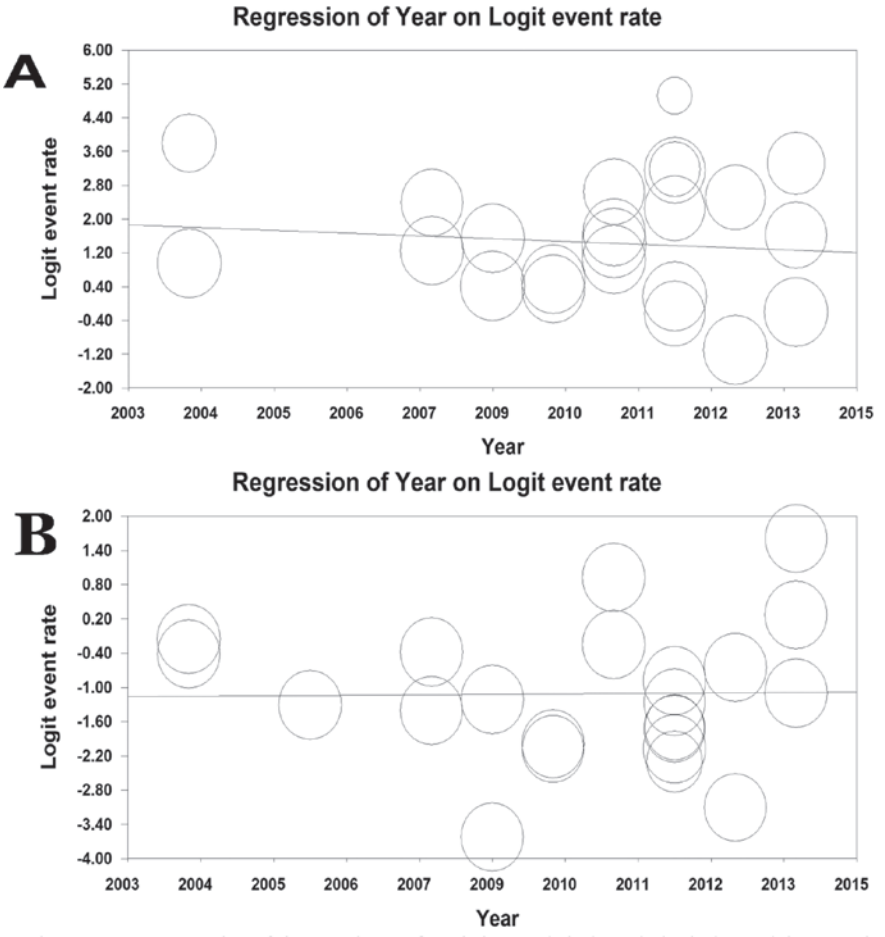


**FIGURE 7.** Meta-regression of the prevalence of workplace verbal (A) and physical (B) violence against nurses in Iran based on year of studies.

The prevalence of verbal violence in Iran is reported to be 25%–100%. The subgroup analysis of the heterogeneity of the studies showed that factors like geographical region can significantly affect the results. Some studies argued that the clinical center (May & Grubbs, 2002) and the female or male samples (Edward et al., 2016) can be among the factors that cause the difference in statistical results. One study indicated that the female nurses are exposed to verbal violence 21 times more than male nurses (Edward et al., 2016). However, due to certain limitations (lack of reports of violence in terms of the gendrs in most studies), we were not able to present any analysis in terms of gender differences.

The studies show that the prevalence of physical violence against the nurses in Iran is 2.6%–71.6%. Combining the results through meta-analysis, the prevalence of physical violence against the nurses in Iran was estimated to be 24.8%. Given the high heterogeneity of the studies, a subgroup analysis was conducted, which showed that geographical region can be the causes of high heterogeneity. However, this relationship was not observed with regard to the type of analyzed questionnaire and year of the

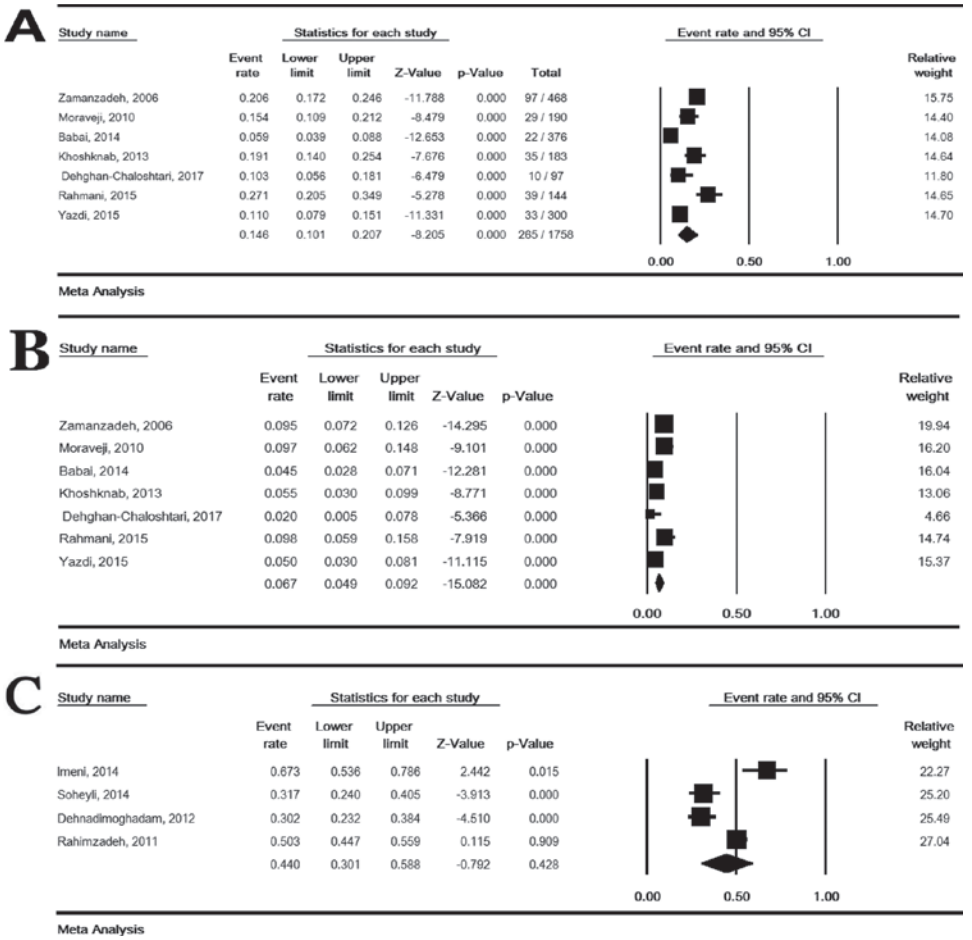


**FIGURE 8.** Meta-analysis of the prevalence of workplace racist (A), sexual (B), and threat (C) violence against the nurses in Iran. CI = confidence interval.

study. Moreover, the type of clinical workplace and gender of the nurses may affect the statistical results. However, because of research limitations, we were not able to study the differences caused by the type of clinical workplace and gender. Other countries such as Jordan (52.8%), the United States (52.8), Canada (34%), and Turkey (19.7%) have reported physical violence against nurses over 1 year of work (Al-Omari, 2015; Duncan et al., 2000; Shields & Wilkins, 2009; Senuzun Ergün & Karadakovan, 2005).

In general, all studies have reported that verbal violence is more common than physical violence. This is because of the nature of violent acts since people usually begin by violent verbal acts.

Moreover, the female nurses take the intimidations, and violent acts more seriously. This can be due to thoughts of those who started the violence are that women are weaker than men or can be considered cultural differences (Shohan et al., 2017; Sohrabzadeh, Menati, Tavan, Mozafari, & Menati, 2015). In studies done by other researchers including Al-Omari (2015), Celik, Celik, Ağirbaş, & Uğurluoğlu, 2007;

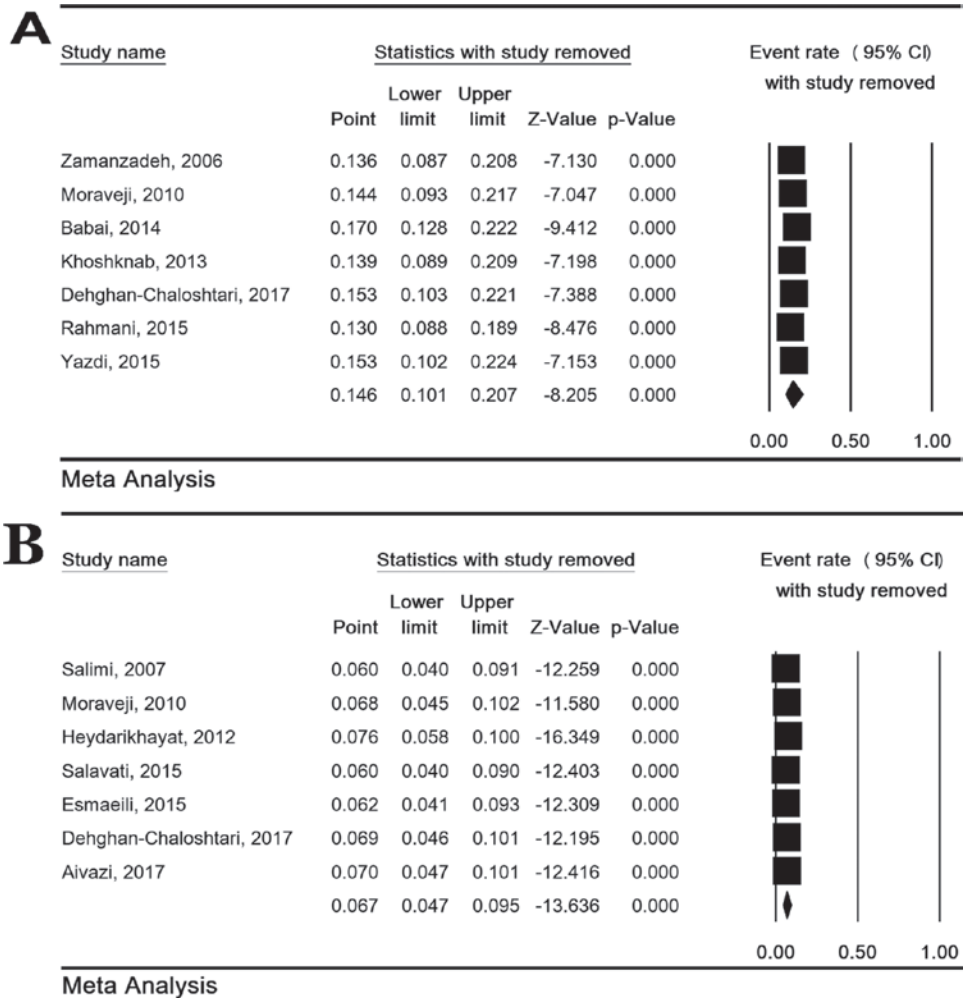


**FIGURE 9.** Sensitivity analysis of the prevalence of workplace racist (A) and sexual (B) violence against the nurses in Iran. Random effects model. CI = confidence interval.

Duncan et al., 2000), and Kwok et al. (2006), it was found that verbal violence is more common than physical violence.

In a study by Esmaeilpour et al. (2011), they have used four questionnaires from The International Labor Organization, The WHO, The Internal General Service Organization, and ICN in 2003, referring to violence against health personnel. These questionnaires were adapted to the context of Iran by the researchers. In their study, it was concluded that verbal and physical violence against the nurses in Iran are 91% and 19.7%, respectively, which is consistent with findings of the present study.

The violence against the nurses can be employed by the patient, patient's relatives, and hospital staff. The meta-analysis showed that verbal violence is employed more frequently by patient's relatives compared to others. According to the reports of the WHO, most of the aggressors are among the patient's relatives. This is consistent with the findings of the present study. However, some studies, including, Magnavita and

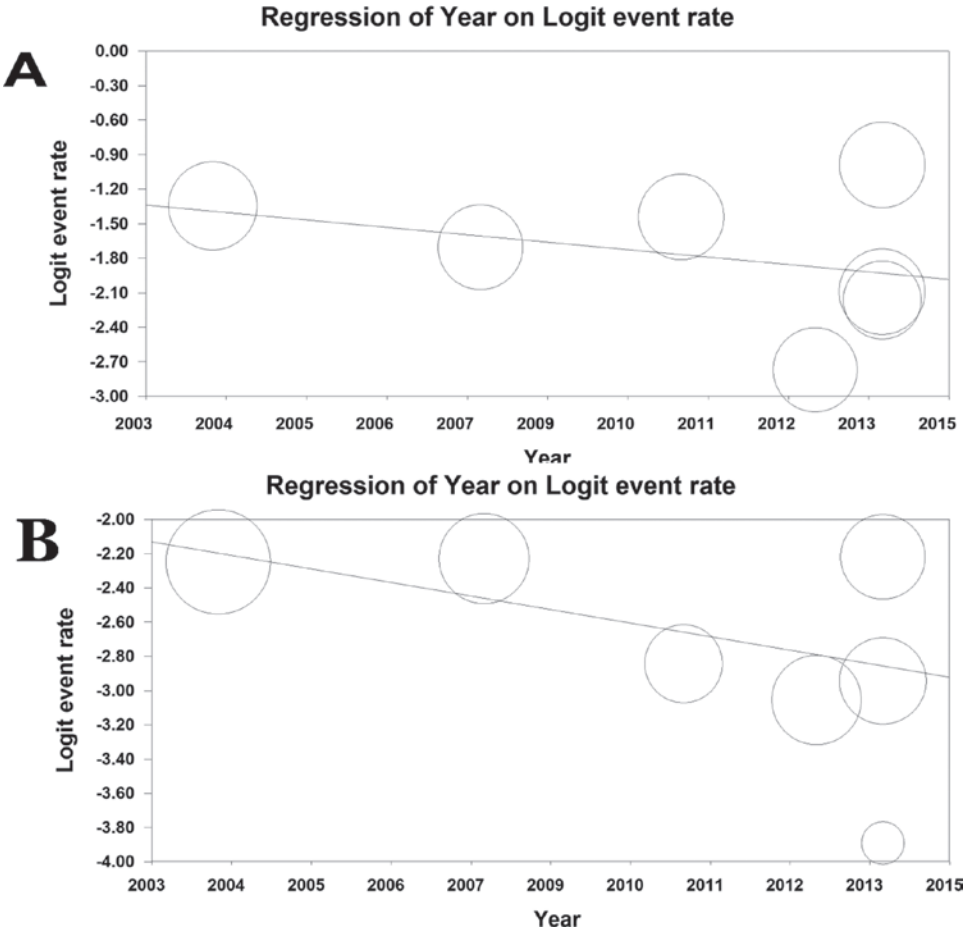


**FIGURE 10.** Meta-regression of the prevalence of workplace racist (A) and sexual (B) violence against nurses in Iran based on year of studies.

Heponiemi (2011), and Pai and Lee (2011), have reported that most of the aggressors are the patients themselves.

Kitaneh indicates that nurses are embarrassed to report violence and are concerned about their future career, and some of them do not consider violence as an important issue (Kitaneh & Hamdan, 2012), while Zamanzadeh in his study argued that the failure to report violence and, as a result, lack of information on this problem, are major issues in the implementation of violence reduction programs (Zamanzadeh et al., 2006).

Esmaeilpour et al. (2011) indicated that in some countries including Iran, when someone is hospitalized, almost all family members and relatives try to go the hospital and pay him/her a visit, often more than one time. This is a part of traditional Iranian culture. It is obvious that in such cases, any shortcoming or long waiting time can lead to disputes between the nurses and the relatives of the patients. The results of this study showed that verbal violence toward nurses is more common than physical violence. Therefore, violence pattern as a culture-based phenomenon can be varied in different communities. To provide safe care, health officials and hospital administrators should

provide appropriate prevention protocol according to their organizational culture across the world.

### The Limitations of the Study

1. The insensitivity of Iranian databases to the use of AND/OR in conducting combined searches.
2. Due to lack of any reports on violent acts in terms of the type of the clinic, no statistical finding was presented in this study.
3. There are little statistical reports about violence in terms of gender. Therefore, we could not present any reports in this regard.
4. Since there is little research on racist and sexist violence and threat, we were not able to carry out a subgroup analysis.

## CONCLUSION

Nurses are on the forefront of healthcare services. It is highly crucial to increase occupation safety and use the experience of nurses in developing a protocol to prevent violence in the workplace. It is obvious that if the nurses themselves do not feel safe enough, they cannot provide a sense of safety for the patients. Given the high rate of violence against the nurses in Iran and the dire consequences in terms of personal, professional, organizational, financial, and judicial aspects, it is important to highlight preventive measures such as public education, official reporting of violence, investigating the violent cases by a group of experienced hospital team, assigning an independent attorney for protecting the rights of the nurses, training the nurses about strategies to cope with and manage violent acts, and using physical preventive measures such as hospital guards. It goes without saying that the nurses can have a better performance in a safer place and thus provide more efficient services for the patients. All the nurses around the world, especially in developing countries with health settings similar to Iranian hospitals, should focus on preventive protocols since prosecuting the cases of violence against nurses can be highly costly, time-consuming, and ambiguous.

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## APPENDIX. PubMed Search Strategy

Exp “Violence”[MeSH]/
Exp “Aggression”[MeSH]/
Exp "Workplace"[MeSH]/
Exp “Workplace Violence”[MeSH]/
Exp “Occupational Exposure”[MeSH]/
Exp “Nurses”[MeSH]/
Exp “Personnel”/
Exp “Epidemiology”[MeSH]/
Exp "Prevalence"[MeSH]/
Exp “Iran”[MeSH]
1 OR 2 OR 3 OR 4 OR 5
6 OR 7
8 OR 9
11 AND 10
12 AND 10
11 AND 13
12 AND 13