



# Prevalence of Type II and Type III Workplace Violence against Physicians: A Systematic Review and Meta-analysis

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## Abstract

**Background:** Workplace violence (WPV) in the health care sector remains a prominent, under-reported global occupational hazard and public health issue.

**Objective:** To determine the types and prevalence of WPV among doctors.

**Methods:** Primary papers on WPV in medicine were identified through a literature search in 4 health databases (Ovid Medline, EMBASE, PsychoINFO and CINAHL). The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for the mapping and identification of records. To assess the studies included in our review, we used the Critical Appraisal Skills Programme cohort review checklist and the Risk of Bias Assessment.

**Results:** 13 out of 2154 articles retrieved were reviewed. Factors outlining physician WPV included (1) working in remote health care areas, (2) understaffing, (3) mental/emotional stress of patients/visitors, (4) insufficient security, and (5) lacking preventative measures. The results of 6 studies were combined in a meta-analysis. The overall prevalence of WPV was 69% (95% CI 58% to 78%).

**Conclusion:** The impact of WPV on health care institutions is profound and far-reaching; it is quite common among physicians. Therefore, steps must be taken to promote an organizational culture where there are measures to protect and promote the well-being of doctors.

**Keywords:** Physicians; Workplace violence; Systematic review [publication type]; Meta-analysis [publication type]; Occupational medicine

## Introduction

Workplace violence (WPV) in the health care sector remains a prominent, under-reported global occupational hazard. Currently,

more than 50% of employees and approximately 25% of physicians from the emergency department reported encounters of physical assaults.<sup>1-5</sup> The prevalence is likely even higher in some settings such as mental health units where physicians experi-

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For more information on workplace violence against nurses in Iran see <http://www.theijoem.com/ijoem/index.php/ijoem/article/view/1556>



ence verbal and physical violence repeatedly due to the nature of their patients.<sup>4</sup> Doctors worldwide typically endure verbal abuse, threats or actual physical violence from patients or their family members (type II violence), and even physicians and their co-workers (type III violence).<sup>6-8</sup> An incident of an intoxicated patient striking a physician during the initial examination is an example of type II WPV.<sup>4,9</sup> In type III WPV, the perpetrator is a current or former employee of the organization; a recently fired worker assaulting his or her former manager is an example of type III WPV.<sup>4,9</sup>

Research efforts have been made to identify antecedent factors of WPV to help create preventative interventions and understand the economic, health, as well as social consequences associated with WPV.<sup>15</sup> However, a review of the literature has demonstrated that there are inconsistencies in results reported.<sup>3,4</sup>

The more developed areas in research look at perpetrators of WPV (*eg*, patients) and their victims (*eg*, physicians) as well as quantifications of violent encounters.<sup>4</sup> Investigators have yet to identify experimental approaches that comprise an applicable model to mitigate WPV risk reduction and to identify the underlying mechanisms and antecedent factors.<sup>10</sup> It is also improbable that a basic, “one-size-fits-all” model can be developed as a method for violence prevention.<sup>10,11</sup> Even though violence prevention training is widely available for employees, this has been unsuccessful so far in reducing rates of occurrence for WPV.<sup>12</sup> Furthermore, physicians tend to under-report many violent incidents due to the common health care principle which accepts violence as “part of the job”<sup>12</sup>. Thus, accentuating the gaps in WPV statistical knowledge since health care providers often do not hold their assailants responsible for their behavior.<sup>13</sup> A large focus on customer service in the health care sector acts

as a secondary deterrent to WPV reporting since the approach remains that the “customer is always right.”<sup>14</sup> Nonetheless, we still see a significantly large incidence of WPV among physicians in the health care sector that remains to be addressed.

Research has shown that emergency physicians are at a higher risk of WPV due to the large intake of patients in various states (*eg*, intoxicated, delirious, *etc*) and report higher rates of mental distress.<sup>21</sup> If physicians are experiencing poor mental health due to occupational stressors, a higher rate of medical mistakes and poorer patient outcomes are to be expected.<sup>15-17</sup> In response, coping mechanisms are typically common; physicians use them to escape or avoid certain situations that they associate with their WPV experience, in addition to seeking social support.<sup>18</sup>

Given the high rates of WPV in the health care sector, and its impact on the mental health of physicians, financial losses to the institutions and poorer patient outcomes, it is essential to prioritize prevention of WPV. There are many diverse estimates of WPV prevalence, but the causes are still not clearly known in a specific setting. The objective of this systematic review was therefore to identify the antecedent factors of type II and type III WPV present in the work environment of doctors. Moreover, a meta-analysis was completed to estimate the prevalence of WPV among doctors in these settings.

## Materials and Methods

This systematic review is registered with the PROSPERO (international prospective register of systematic reviews) under CRD42017070159. The following databases were utilized for the collection of relevant publications: Ovid Medline (1946 to November 17, 2018), EMBASE (1980 to November 17, 2018), PsychoINFO (2002 to November 17, 2018), and CINAHL

[www.SID.ir](http://www.SID.ir)

(1982 to 2018) using a PICO framework to assist and refine the search process.

### Search Strategy and Study Selection

The search criteria were finalized with the assistance of a health research librarian; all articles chosen were published in English. Our process complied with the requirements of each database used (Appendix). The selected articles were retrieved on September 16, 2016 and updated on November 17, 2018. The studies chosen for this review contained information regarding various types of WPV (*eg*, patient on worker violence, and worker on worker violence) that physicians are exposed to, as well as the antecedent factors and repercussions of these violent occurrences.

### Inclusion and Exclusion Criteria

The studies chosen for this review contained information regarding type II or type III WPV. For example, they may include client on worker violence, and worker on worker violence that physicians are exposed to, as well as the antecedent factors and repercussions of these violent occurrences. The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for the mapping and identification of records. A data extraction form was used based on the Systematic Review Data Repository (<http://srd.ahrq.gov>) from the US Department of Health and Human Services. Three reviewers took part in accurately sorting and assembling the acquired data in an organized fashion. The information sought out from each article was the type of WPV, the type of injury assessed, the type of worker injured (*eg*, doctors), the antecedent factors to an occupational injury, sample size, author, and year and country of publication. Any discrepancies were thoroughly discussed and voted on by the rest of the research team.

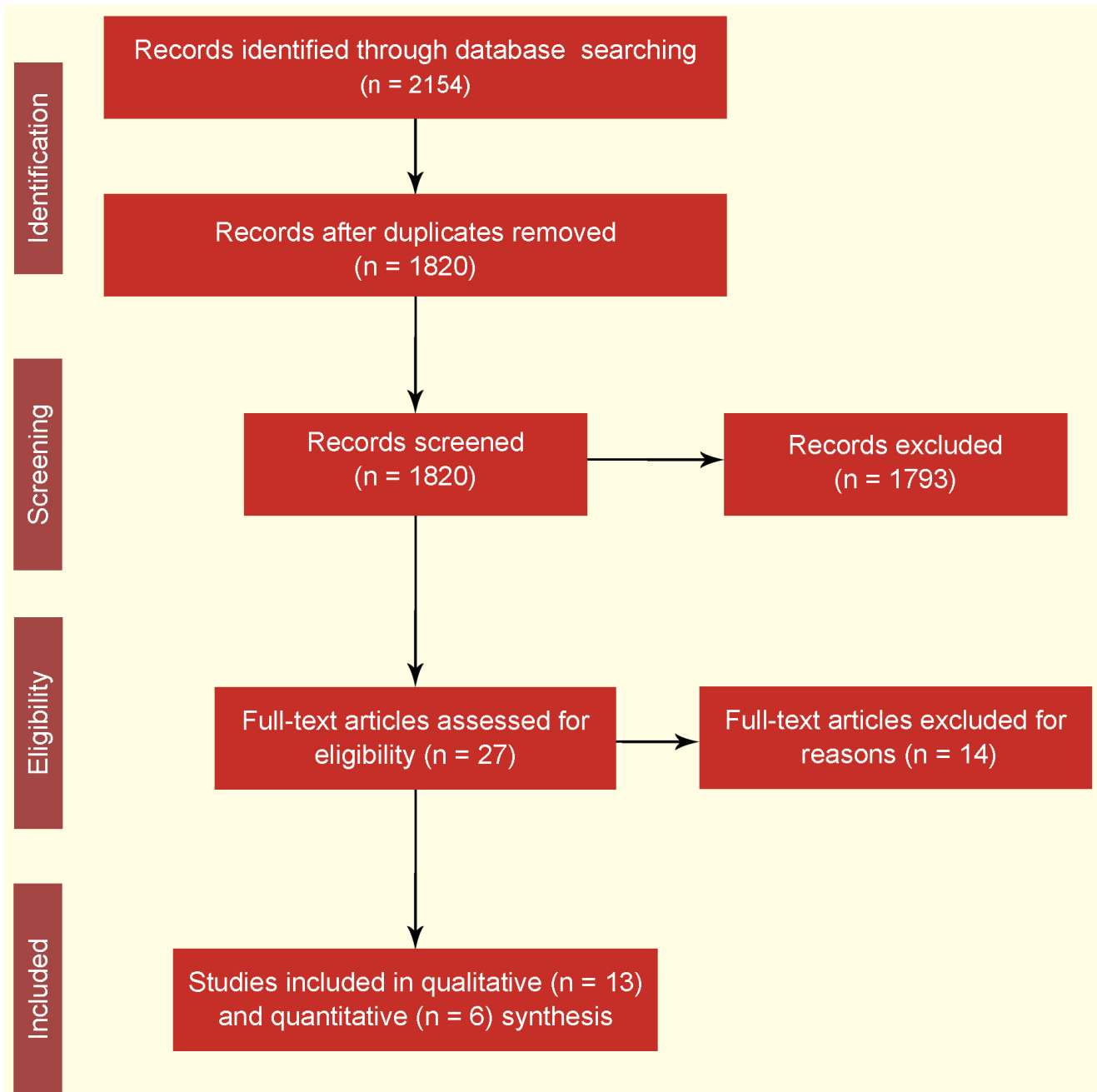
### TAKE-HOME MESSAGE

- In the health care sectors, workplace violence (WPV) is the most under-reported global occupational hazard.
- This study was conducted to determine the types and prevalence of WPV among doctors.
- WPV can appear in many ways (physical, verbal, sexual, *etc*) and lead to a multitude of negative consequences for physicians worldwide.
- Several steps must be taken to promote an organizational culture where there are measures to protect and promote the well-being of health care workers.

### Article Assessment

To assess the studies included in our review, we used the Critical Appraisal Skills Programme (CASP) cohort review checklist.<sup>19</sup> This tool was used by three reviewers to evaluate the relevance, validity, and quality of each article. The first 12 questions were considered. A composite score was then generated from the questions and reported for each article.

The risk of bias was examined using the Cochrane Collaboration “risk of bias” assessment tool across six domains (selection bias, performance bias, detection bias, attrition bias, reporting bias, and other biases).<sup>20</sup> An overall summary of the risk of bias for each study was reported. A study was considered “low risk” if attrition bias due to missing data was unlikely to be related to WPV (*eg*, for survival analysis data, censoring was unlikely to introduce bias). A study was designated “unclear” if there was insufficient information to determine its risk of bias. Eligible for inclusion in this meta-analysis were all prospective studies that addressed the prevalence of WPV among physicians, such as sociodemographic factors, health (behavior), mental health, psychosocial work factors, personal factors, and organizational factors, on



**Figure 1:** Flow diagram of the inclusion process. Number of articles after removing duplicates: Medline (n = 466), PsycInfo (n = 718), CINAHL (n = 334), and EMBASE (n = 636)

sickness absence of physicians.

#### Definition of Workplace Violence

WPV can be defined as violence, such as assault or threat of assault, involving an

individual performing their job duties.<sup>4</sup> For this review, WPV can be characterized according to the type of relationship between the two involved parties.

### Statistical Analysis

A meta-analysis of proportions was performed using the data obtained from selected articles. An arcsine transformation was applied to establish the variance of proportions (Freeman-Tukey variant of the arcsine square root of transformed proportions method). The pooled proportion was calculated as the back-transformation of the weighted mean of the transformed proportions, using inverse arcsine variance weights for the random effects model. We applied DerSimonian-Laird weights for the random effects model. The  $I^2$  statistic was also calculated as a measure of the overall variation in the proportion that was attributable to between-study heterogeneity. All analyses were performed with R 3.4.3 using “metafor” package for the meta-analysis of proportions.<sup>21,22</sup> The standard meta-analytic procedures assumed that results were independent.

### Results

#### Summary of Study Findings

A total of 13 out of 2154 articles retrieved was reviewed (Fig 1).<sup>5,18,23-33</sup> The mean CASP score was 8.54 (SD 1.05, range 7 to 10). The articles were categorized by the type of violence (patient on worker violence and client on worker violence and worker on worker violence). The majority of the articles reviewed report type II violence (92%); one study (8%) reports type III. Our systematic review outlined the following factors for physician WPV: (1) working in remote health care areas, (2) understaffing, (3) mental/emotional stress of patients/visitors, (4) insufficient security, and (5) lacking preventative measures. Subsequently, six of the articles wherein data were available, were included in a meta-analysis of the prevalence of WPV.

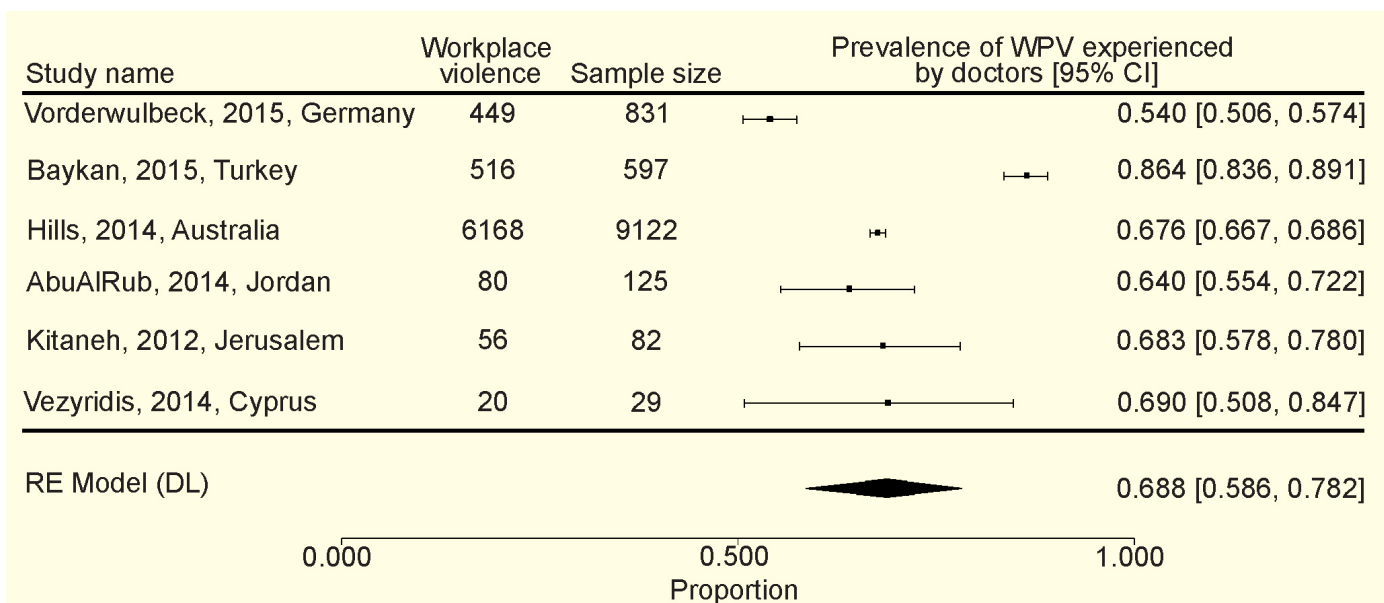
All of the studies included were descriptive and cross-sectional in nature.<sup>5,18,23-26,28,29,31-33</sup> Eight included mental/emotional correlates associated with WPV against doctors.<sup>5,18,25,26,28,30-32</sup> For example, perpetrators of WPV were those with an altered state of mind or with behavioral issues such as aggression<sup>5,26,32</sup> or substance use such as alcohol or drugs<sup>32</sup>. Verbal insults, witnessing WPV, threats, and physical aggression were also contributing factors to WPV.<sup>25</sup>

One study identified insufficient organizational resources, understaffing, and lack of management support as the main causes of WPV. Baykan, *et al*, found that 86.4% of physicians were exposed to physical, verbal, and sexual violence during their employment.<sup>24</sup> Factors associated with WPV included environmental factors and excessive demands of patients on doctors and using doctors as their scapegoat.

Insufficient security was another factor associated with increased WPV among doctors. Specifically, physical violence led to decreased doctors retention in their current position; both bullying and physical violence led to reduced job satisfaction.<sup>27,29</sup> Evidence also suggests WPV occurred more frequently in remote or underserved areas.<sup>23</sup> Furthermore, contributing factors to WPV were related to the absence of organizational policies, inadequate staffing and lack of communication skills.<sup>23</sup> Male doctors were more often the subject of physical abuse (27.6%) than female doctors (16.2%). On the other hand, females (64.1%) were victims of non-physical violence more often than males (53.1%).<sup>29</sup>

The organizational climate included lack of preventive measures to impede WPV. Doctors who did not attend preventative violence training sessions due to a gap in hospital management, lack of experience, and higher workloads were more prone to WPV.<sup>33</sup>





**Figure 2:** Prevalence of workplace violence among physicians

**Quality Assessment**

The overall risk of bias for all but one of the studies was low across the six domains of biases studied (Table 1). One study was categorized as “unclear” due to insufficient information provided. Overall, the study signifies the necessity of job control as a buffer for stressful working environments subjected to WPV.

**Meta-analysis**

The overall prevalence of WPV pooled from the results reported in six studies was 69% (95% CI 58% to 78%) (Fig 2).<sup>23,24,28,29,31,32</sup> The I<sup>2</sup> statistic was 0.974. Thus, a random-effect model was used.<sup>34</sup>

**Discussion**

Violence in the workplace can appear in many ways (physical, verbal, sexual, etc) and lead to a multitude of negative consequences for physicians worldwide, as demonstrated by this study. The perpetrators, causes, and consequences of WPV are not always clear, because of under-reporting

and lack of investigative efforts by managing bodies.<sup>24,29,30</sup> However, given the severity of WPV on physician well-being, it is crucial to better understand WPV itself, and the impact of inaction.

Our systematic review identified that the majority of incidents reported by participating physicians were preventable. Most respondents were also very dissatisfied with the way their violent incidents were handled/investigated.<sup>25,29</sup> This evidence further accentuates the need for attention and action from international administrative bodies to confront WPV by implementing additional protocols. Specifically, financial investments should be made to mitigate WPV and help workers who have already experienced WPV (regardless of the type of violence).<sup>18</sup>

The study found that most doctors were susceptible to type II WPV (92% of articles) regardless of their work environment, organizational culture and structure, and access to resources. The prevalence of WPV against doctors in health care settings is high, however these data are difficult to

**Table 1:** Characteristics and antecedent factors of type II and type III studies of workplace violence among doctors

Author, year, country	Sample size, years examined, study design, type of violence	Antecedent factors	CASP grade	Summary risk of bias
1. AbuAIRub and Al Khawaldeh, 2014, Jordan	n=521, 2013–2014, descriptive/exploratory research design, type II	<p>&gt; <i>Patient on worker violence:</i></p> <ul style="list-style-type: none"> <li>- Factors related to administration (<i>ie</i>, no assertive legislations, ineffective solutions for violent incidents, long shift hours, short level of staff, inappropriate work environments, lack of sources provided)</li> <li>- Factors related to staff (<i>ie</i>, lack of communication, poor quality care, lack of proper training giving rise to inexperienced staff)</li> <li>- Factors related to their patients and families (<i>ie</i>, increased level of anxiety and tension, notions of poor-quality health care, life stress, no/lack of health insurance)</li> <li>- Factors related to security (<i>ie</i>, inexperienced or simply unqualified security staff, increased traffic of public and visitors' access, uncontrolled visiting time)</li> </ul>	7	Low risk
2. Baykan <i>et al</i> , 2015, Turkey	n=597, 2012, descriptive study, type II	<p>&gt; <i>Patient on worker violence:</i></p> <ul style="list-style-type: none"> <li>- Environmental factors</li> <li>- Attitudes of politician/managers, media and uneducated locals</li> <li>- Excessive demands of patients</li> <li>- Patients using doctors as their scapegoat, immediate resolvent</li> </ul>	10	Low risk
3. da Silva <i>et al</i> , 2015, Brazil	n=2940, unspecified, cross-sectional, type II	<p>&gt; <i>Patient on worker violence:</i></p> <ul style="list-style-type: none"> <li>- Depressive symptoms and major depression (<i>ie</i>, more prone to react when faced with complaints or aggressive behavior)</li> <li>- Patients being disappointed from having high expectations of service</li> </ul>	8	Low risk
4. Hahn <i>et al</i> , 2012, Switzerland	n=2495, 2007, cross-sectional survey, type II	<p>&gt; <i>Patient on worker violence:</i></p> <ul style="list-style-type: none"> <li>- Those trained in aggression management</li> <li>- Professionals working with patients over the age of 65</li> <li>- Professionals who work in emergency rooms, outpatient rooms, intensive care units, recovery rooms, anesthesia, intermediate care and step-down units</li> </ul>	9	Low risk

Continued

**Table 1:** Characteristics and antecedent factors of type II and type III studies of workplace violence among doctors

Author, year, country	Sample size, years examined, study design, type of violence	Antecedent factors	CASP grade	Summary risk of bias
5. Heponiemi <i>et al</i> , 2014, Finland	n=1515, 2006–2010, cohort study, type III	<ul style="list-style-type: none"> <li>&gt; <i>Worker on worker violence</i>:</li> <li>- Decrease in job control (<i>ie</i>, lack of opportunities to learn and improve on skills, lack a variety of tasks)</li> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- No direct measures like no metal detectors for metal weapons, no security dog teams, no cameras and security personnel all-in-all to decrease/prevent WPV</li> </ul>	9	Low risk
6. Hills and Joyce, 2014, Australia	n=9449, 2010–2011, cross-sectional descriptive, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Patient with a medical condition or undergoing psychosocial circumstances</li> <li>- Patient with cognitive impairment or arousal, frustration or distress</li> <li>&gt; <i>Worker on worker violence</i>:</li> <li>- Less experienced clinicians</li> </ul>	9	Low risk
7. Kitaneh and Hamdan, 2012, Jerusalem	n=271, 2011, cross-sectional, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Less experience, low level of education, under-reporting due to fear of consequences, lack of management support</li> </ul>	9	Low risk
8. Mantzouranis <i>et al</i> , 2015, Greece	n=175, 2013, descriptive study using questionnaire, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Long wait times</li> <li>- Patient with drug and alcohol abuse</li> <li>- Patient with psychiatric disorders</li> <li>- Disobedience of patients, relatives and friends</li> <li>- Lack of sufficient personnel on site</li> </ul>	9	Low risk
9. Pompeii <i>et al</i> , 2015, USA	n=2098, unspecified, descriptive, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Altered mental status, behavioral issues</li> <li>- Patient with pain/medication</li> <li>- Patient dissatisfied with care</li> </ul>	7	Low risk
10. Vezyridis, Samoutis, and Mayrikiou, 2015, Cyprus	n=220, 2012–2013, cross-sectional, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Altered mental status, behavioral issues</li> <li>- Patient with pain/medication</li> <li>- Patient dissatisfied with care</li> </ul>	9	Low risk
11. Vorderwulbeck, <i>et al</i> , 2015, Germany	n=831, 2013, questionnaire-based, type II	<ul style="list-style-type: none"> <li>&gt; <i>Patient on worker violence</i>:</li> <li>- Patient who uses alcohol</li> <li>- Patient who uses drugs</li> <li>- Patient with mental illness</li> </ul>	8	Low risk



Continued

**Table 1:** Characteristics and antecedent factors of type II and type III studies of workplace violence among doc

Author, year, country	Sample size, years examined, study design, type of violence	Antecedent factors	CASP grade	Summary risk of bias
12. Wu <i>et al</i> , 2015, Taiwan	n=189, 2009, cross-sectional, type II	> <i>Patient on worker violence:</i> - Vast increase in health services volume and so as a consequence, short consultations occur which in turn will anger patients - Safety climate (a protective factor for WPV that mediates the relationship between work-derived violence and negative consequences, job satisfaction and work engagement) - Excessive volume of physicians' job demands which can result to poor quality service leading to angered patients - Hospital administration needing to ensure enough health care staffing levels to prevent WPV	7	Unclear risk; used convenient sampling for recruitment may pose some bias
13. Zafar <i>et al</i> , 2016, Pakistan	n=179, 2013, cross-sectional, type II	> <i>Patient on worker violence:</i> - Mental health	10	Low risk

compare.<sup>35</sup> In the literature, comparisons of WPV prevalence rates across countries range from 54% in Thailand<sup>36</sup> to 70% in Morocco<sup>37</sup>. The results are heterogenous, making comparison across countries challenging. Nonetheless, this systematic review supports the argument that exposure to WPV has deleterious health outcomes for doctors and provides an opportunity for target workplace interventions.<sup>38</sup> Specifically, mental health interventions could examine the consequences of burnout,<sup>39</sup> decreased job performance,<sup>40</sup> depression,<sup>41</sup> and post-traumatic stress disorder<sup>42</sup> in doctors who experience WPV. These interventions may include health promotion strategies (eg, mindfulness meditation), limiting the exposure to violence or providing resources to reduce workload demands.

At the policy level, prevention must be placed into existing occupational health and safety legislations to provide strate-

gies for prevention and management of WPV, promote its reporting and follow up, and provide supports to physicians who experienced violence. Furthermore, the systematic review outlines predictors and consequences by type of WPV against physicians; it also implies possible solutions that can rectify these incidents and tackle their consequences. Specifically, studies from Brazil, Germany, Pakistan, Taiwan, and the USA emphasize the importance of addressing the mental health needs of physicians who have experienced WPV implementing strategies to prevent WPV.

The consequences of inaction against violent incidents towards physicians are severe. Some of these include (1) waste of time, (2) mental health problems (PTSD, depression, burnout, depersonalization), (3) lack of sense of safety/protection, and (4) emotional distress (anger, humiliation, fear, guilt).<sup>18,30</sup> One such approach would be to implement mental health first aid

training so that physicians are more confident about interacting with individuals experiencing a mental health problem or crisis. Furthermore, there should be an increase in resources available to physicians in crisis (as a result of experiencing WPV) or experiencing mental health problems. The available evidence shows that 69% of physicians were subjected to various types of WPV (physical, verbal, sexual, *etc*). Physical, verbal, and sexual violence were different types of WPV reported in 62% of physicians who faced moderate WPV; 38% experienced severe WPV.<sup>10</sup> Furthermore, this review supports evidence from a 2014 survey on hospital crime that type II WPV accounted for 75% of aggravated assaults and 93% of all assaults against workers.<sup>43</sup>

Despite all efforts we made to estimate the prevalence of WPV, the study has several limitations. WPV is a complex health and social issue with a multifactorial etiology.<sup>35</sup> As a result, the comprehensiveness of this meta-analysis is difficult to reach. For instance, it is not feasible to infer a homogenous association between all the factors linked with WPV among physicians. Nonetheless, we included these studies because they offer important factors that are different from one another and each could provide a meaningful and distinct contribution to the meta-analysis. Another limitation was that the data were limited by what the authors reported, and upon additional solicitation, six of the 13 studies shared their physician data for this meta-analysis. Moreover, the studies included in the systematic review were cross-sectional and exploratory in nature, restricting the inferences that are possible.

The impact of WPV on health care institutions is profound and far-reaching. Therefore, steps must be taken to promote an organizational culture where there are measures to protect and promote the well-being of doctors. Our recommendations are to encourage policy amendments that

may begin to alleviate the negative impacts of WPV against physicians, including to (1) create clear and reliable procedures for reporting aggressive acts (regardless of the type of violence), (2) establish thorough organizational guidelines to protect doctors, (3) utilize assessment teams (*eg*, through the use of existing joint occupational health and safety committees) to increase security in vulnerable areas, and (4) improve staffing methods and permit doctors time off work to recover and return to work. Furthermore, there is a need for training and workshops for health professionals in advance to recognize the signs and situations that increase the risk of WPV and ways to defuse aggression. Such workshops should be implemented as part of health and safety training and include refresher courses on a regular basis.

**Conflicts of Interest:** None declared.

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