

# ViSHWaS: Violence Study of Healthcare Workers and Systems – a global survey

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## ABSTRACT

**Objective** To provide insights into the nature, risk factors, impact and existing measures for reporting and preventing violence in the healthcare system. The under-reporting of violence against healthcare workers (HCWs) globally highlights the need for increased public awareness and education.

**Methods** The Violence Study of Healthcare Workers and Systems study used a survey questionnaire created using Research Electronic Data Capture (REDCap) forms and distributed from 6 June to 9 August 2022. Logistic regression analysis evaluated violence predictors, including gender, age, years of experience, institution type, respondent profession and night shift frequency. A  $\chi^2$  test was performed to determine the association between gender and different violence forms.

**Results** A total of 5405 responses from 79 countries were analysed. India, the USA and Venezuela were the top three contributors. Female respondents comprised 53%. The majority (45%) fell within the 26–35 age group. Medical students (21%), consultants (20%), residents/fellows (15%) and nurses (10%) constituted highest responders. Nearly 55% HCWs reported firsthand violence experience, and 16% reported violence against their colleagues. Perpetrators were identified as patients or family members in over 50% of cases, while supervisor-incited violence accounted for 16%. Around 80% stated that violence incidence either remained constant or increased during the COVID-19 pandemic. Among HCWs who experienced violence, 55% felt less motivated or more dissatisfied with their jobs afterward, and 25% expressed willingness to quit. Univariate analysis revealed that HCWs aged 26–65 years, nurses, physicians, ancillary staff, those working in public settings, with >1 year of experience, and frequent night shift workers were at significantly higher risk of

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Violence against healthcare workers (HCWs) has been reported across the globe, and its frequency has increased over the years.
- ⇒ Existing knowledge underscores the under-reporting of violence against HCWs.

## WHAT THIS STUDY ADDS

- ⇒ The Violence Study of Healthcare Workers and Systems (ViSHWaS) study confirms the global prevalence of violence against HCWs and offers significant contributions to understanding its nature, risk factors and consequences on both HCWs and the healthcare system.
- ⇒ Violence has substantial impact on the morale of HCWs. Those who experience violence are more prone to feel demotivated in their work or contemplate leaving their jobs.
- ⇒ The study highlights a concerning trend during the COVID-19 pandemic, with the majority of HCWs perceiving that violence rates either increased or remained constant compared with the prepandemic period.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The study highlights the need for comprehensive strategies to address workplace violence's impact on HCWs and emphasises the urgency of implementing preventive measures and public awareness to address violence against HCWs.
- ⇒ Understanding the risk factors and impact of violence can inform policy decisions and guide the development of interventions to ensure a safer working environment for HCWs.

experiencing violence. These results remained significant in multivariate analysis, except for the 55–65 age group, which lost statistical significance.

**Conclusion** This global cross-sectional study highlights that a majority of HCWs have experienced violence, and the incidence either increased or remained the same during the COVID-19 pandemic. This has resulted in decreased job satisfaction.

## INTRODUCTION

Violence against healthcare workers (HCWs) is an unfortunate reality in medical practices across the globe. The WHO reports that up to 38% of HCWs face scenarios of brutality at least once during their career and 16 times more than in other professional fields.<sup>1 2</sup> According to a 2016 Centers for Disease Control and Prevention (CDC) report, 70% of workers in the private industry who experienced workplace violence (WPV) belonged to the healthcare and/or social assistance industry.<sup>3</sup> The WHO defines WPV as ‘incidents where staff is abused, threatened or assaulted in the circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health.’<sup>4</sup> WPV has four categories, with type II (pertaining to the involvement of patients or their family members in attacks against HCWs) being the most common.<sup>5–7</sup> Various reports suggest that WPV incidence has escalated in recent years and throughout the COVID-19 pandemic.<sup>8–11</sup>

WPV includes verbal abuse, psychological harm, physical or sexual assault, racial harassment and cyber persecution. The 2016 Occupational Safety and Health Administration (OSHA) guidelines identify WPV risk factors within healthcare facilities—patients with a history of psychiatric illnesses, violence or substance abuse; understaffed emergency departments; lengthy patient waiting periods and restricted access within healthcare facilities.<sup>12–14</sup> Reports from India identified additional risk factors, including misrepresentation of HCWs by the media, poor healthcare quality, low health literacy rate, poor communication and lack of faith in the judicial process.<sup>15</sup> Different countries might have various risk factors, but the repercussions of WPV among HCWs are the same.

A violent episode can have a severe impact on HCWs, including extensive injuries, death, psychological distress, burnout, higher rate of medical errors, poorer patient outcomes and increased attrition.<sup>16 17</sup> Researchers have yet to identify the underlying mechanisms and factors for WPV, which could guide an appropriate approach to mitigate the risk of violence against HCWs.

Our study intends to address the global prevalence of violence in the healthcare system, the characteristics of violence, its predisposing risk factors, its aftermath and the probable mitigation strategies to prevent them.

## METHODOLOGY

### Study design and timeline

It is a cross-sectional, observational, survey-based study. The survey was created using REDCap forms and conducted for 8 weeks—from 6 June 2022 to 9 August 2022. Using in-person, instant messaging, e-mail and video conference exchanges, a core team ranging across the medical hierarchy and encompassing doctors, nurses, emergency medical technicians (EMTs) and medical students was convened. The ViSHWaS study used the core competencies in human subject research expertise, team building and data storage, cleaning and interpretation that were already present within the Global Remote Research Scholar Program and expanded on it.<sup>18 19</sup>

### Patient and public involvement

Public (respondents) were not involved in the design, or conduct, or reporting or dissemination plans of our research.

### Survey dissemination strategy

To seek maximum responses from as many countries as possible, a ‘hub and spoke model’ of team building was adopted.<sup>20</sup> The senior investigator had prior experience in conducting global survey-based studies.<sup>21–24</sup> The hub of this survey was the core team, which consisted of 11 members from five countries. This team interacted via a dedicated ViSHWaS Research WhatsApp group and weekly video conferencing. Each team member sent the survey to their networks using in-person messaging tools such as direct, WhatsApp messages and e-mails. The core team recruited the country leads or representatives who would serve as the spokes of the ‘hub and spoke’ model.<sup>20</sup> Detailed dissemination strategies and guiding principles have been submitted elsewhere.<sup>25</sup> Each leader was responsible for disseminating the survey in their networks. This was to ensure the responses from the lived experiences of HCWs across various nationalities, ethnicities, races and genders besides the hierarchical sets and subsets of the healthcare workforce.

A digital survey banner was designed for promotional messaging. Thereafter, a wider audience was reached by encouraging global healthcare community engagement using Twitter Spaces, LinkedIn Posts and YouTube videos.<sup>18 19</sup> This helped spread the survey to countries that did not have direct representation via the country leads.

### Sample size

Out of a total of >50 million medical doctors, nurses and allied HCWs worldwide, if 10 million are accessible and assuming that 50% would have faced violence at their workplace. Using the formula below (results from Calculator.net, open-source calculator), with a 95% CI, 1.4% margin of error and a design effect of three (medical doctors, nurses and allied HCWs), the sample size would be 4898. So, we targeted 5000 unique responses. We used the convenience sampling method.

Formula: sample size  $N = (DEFF * Np(1p) / ((d^2 / Z_{1-\alpha/2}^2 * (N-1) + p*(1p)))$ . Here, (N) is the target population size, (p) is the hypothesised per cent frequency of outcome factor in the population, (d) is the confidence limits as per cent out of 100, and DEFF is the design effect.

### Regression analysis

All statistical analyses were performed using STATA statistical software (V.17.0SE, StataCorp, College Station, Texas 77845). A logistic regression model was developed to evaluate the various predictors of violence against HCWs. In the a-priori hypothesis, gender (male, female or others) and institution type (government or non-government) were considered the primary predictors. We hypothesised that the female gender and the government institution type be independent predictors of the higher odds of violence against the HCWs. Considering clinical reasoning and directed acyclic graphs, additional predetermined variables, such as age, years of experience and profession, might confound the association between the hypothesised independent predictors and the outcome being studied and were recognised. Univariate analyses were performed to study the effect of primary (independent) and secondary predictors on the odds of HCW violence.

Simultaneously, multivariate-adjusted models were developed to control for the confounding variables. As HCWs' age and years of experience were found to be strongly correlated, they introduced collinearity to the models. This led us to drop the years of experience from the adjusted regression models. Finally, we performed a  $\chi^2$  test to assess the associations between HCWs' gender and four different violence subtypes experienced by the ViSHWaS survey respondents. Statistical significance was defined by a two-tailed  $p < 0.05$ .

### Preprint and conference presentations

Various subsets of the manuscript have been submitted and accepted as abstracts for presentation at various conferences, including the Society of Critical Care Medicine annual meeting (SCCM 2023) in San Francisco, USA, in January 2023 (also received media coverage); The third Abu Dhabi Integrated Mental Health Conference in Abu Dhabi, UAE, in January 2023; The American Thoracic Society International conference in Washington, DC in May 2023.<sup>25–27</sup> An initial version of the manuscript abstract has been submitted and published on the Lancet SSRN preprint platform.<sup>28</sup>

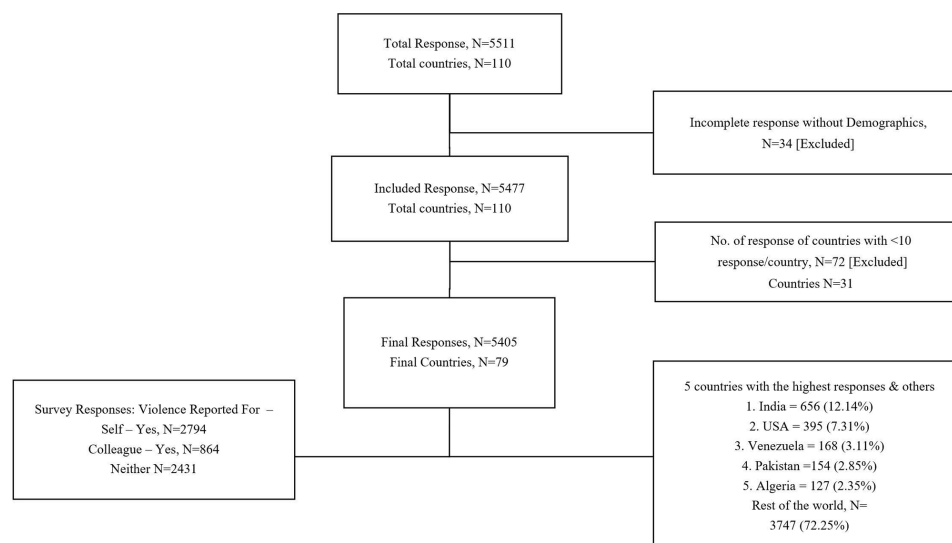
## RESULTS

### Survey response representation

A total of 5511 healthcare professionals responded to the survey from over 110 countries over an 8-week period. From the total, 34 responses were excluded due to unavailable demographic data and/or lack of response to questions regarding experiencing violence and its characteristics. From the remaining 5477 responses, countries with less than 10 responses per country were excluded, thus excluding a total of 72 responses from 31 countries. The final analysis was conducted on 5405 responses from 79 countries (figure 1, online supplemental appendix B–Figure 1 and table 1). Among the top five countries with the maximum responses, India had the highest number (12.1%), followed by the USA (7.3%), Venezuela (3.1%), Pakistan (2.8%) and Algeria (2.3%). The remaining 3747 (69.3%) responses came from the remaining 74 countries (2.9% country name response unavailable) (figure 1, online supplemental appendix B–figure 2 and table 2)

### Demographic characteristics

The respondents primarily consisted of a young adult population (18–35 years of age) (N=4085, 75%), 62% (N=3373) of the respondents had work experience of



**Figure 1** Flow diagram of total survey responses and total number of countries.

**Table 1** Demographic characteristics of survey respondents

		<b>N</b>	<b>Percentage</b>
Gender	Male	2427	44.9
	Female	2868	53.1
	Transgender	7	0.13
	Gender variant/non-confirming	15	0.28
	Other/prefer not to disclose	39	0.72
	Skipped	49	1
Age (years)	18–25	1645	30.4
	26–35	2440	45.2
	36–45	810	15
	46–55	288	5.3
	56–65	144	2.7
	65+	27	0.50
	Skipped	51	1
Race	US-White Caucasian	232	4.29
	US- African American	45	0.83
	US-Asian American	68	1.26
	US-American Indian or Alaska Native	33	0.61
	US-Native Hawaiian/Other Pacific Islander	5	0.09
	White-Caucasian	266	4.92
	Black - African	945	17.48
	South Asian	1336	24.72
	West Asian	632	11.69
	Hispanic/Latino	1009	18.67
	East Asian	139	2.57
	Southeast Asian	222	4.11
	Central Asian	28	0.52
	Mixed Race	236	4.37
	Other	146	2.7
	Skipped	63	1.17
Institution location	USA	395	7.31
	Outside USA	4936	91.32
	Skipped	74	1.37
Type of institution	Government academic	2186	40.14
	Government non-academic	513	9.49
	Private academic	828	15.32
	Private non-academic	459	8.49
	Community hospital	895	16.56
	Military hospital	145	2.68
	Mission/non-profit hospital	90	1.67
	Other	141	2.61
Skipped	148	2.74	

Continued

Table 1 Continued

		N	Percentage
Years of experience	<1	622	11.51
	1–2	978	18.09
	2–5	1773	32.8
	6–10	984	18.21
	11–20	608	11.25
	21–30	245	4.53
	<30	126	2.33
	Skipped	69	1.28
Work position	Administration	229	4.24
	Nurse practitioner (ARNP)	107	1.98
	Attending physician	1098	20.31
	Auxiliary/support staff	108	2
	Dentist/dental surgeon	210	3.89
	EMT	56	1.04
	Fellow in training	307	5.68
	Medical student	1141	21.11
	Occupational therapist	36	0.67
	Pharmacist (PharmD)	117	2.16
	Physical therapist	71	1.31
	Physician assistant (PA)	133	2.46
	Registered nurse (RN)	426	7.88
	Researcher	109	2.02
	Resident/junior resident in training	811	15
	Respiratory therapist	36	0.67
Other	360	6.66	
Skipped	50	0.93	

5 years or less, and a greater number of women (N=2868, 53.1%) responded to the questionnaire than men (table 1)

South Asians represented 24.7% of the respondents, followed by Hispanics/Latinos (18.7%) and Native Africans (17.5%). Almost 50% of respondents worked in government institutions (40.4% in academic, 9.5% in non-academic). In comparison, around 24% worked in private institutions (15.3% in academic, 8.5% in non-academic) and the rest belonged to community, military and mission hospitals. The HCWs across various hierarchies, ranging from medical students (21.1%) to attending physicians (20.3%) and residents (15%), responded to the survey (table 1)

### Violence characteristics

A total of 2974 survey respondents (55.2%) recollected experiencing violence first-hand, while 2431 (45%) reported not experiencing violence themselves at their workplace; out of these, 864 (16%) reported violence faced by their colleague(s), that is, colleague respondents. A total of 1567 (29%) responded that neither

they nor their colleagues faced any violence. From this population, 13 respondents, who did not answer this critical question, were considered as ‘no’ for both self and colleague. They were included in the subset of 1567 HCWs who had responded that neither they nor their colleagues had faced violence. Thus, we recorded 3838 (71%) ‘yes’ and 1567 (29%) ‘no’ out of a total of 5405 responses (figure 1, table 2).

When comparing the form of violence faced by those who responded ‘yes’ for either self or colleague, a similar pattern was observed between the two groups: a majority reported verbal violence as the most common form of violence (40% of 5405 for self and 10.9% of 5405 for a colleague), followed by emotional violence (23.5% for self and 5.94% for a colleague) and physical violence (15.6% for self and 5.8% for a colleague). Online/cyber harassment was also reported by some of the respondents (3.6% for self and 1.2% for colleagues) (table 2, online supplemental appendix B–figure 3).

Of the 3838 reported a history of violence (either self or colleague), 56.1% described the patient itself or

**Table 2** Violence characteristics of survey respondents

<b>Violence of any form at workplace</b>	<b>Count (N=5405)</b>	<b>Percentage</b>
Total yes response—self+colleague (N=5405)	3838	71
Yes response—self (N=5405)	2974	55
Yes response—colleague (N=2431)	864	16
No response—self+colleague (N=5405)	1567	29
<b>Form of violence</b>	<b>Count (N=3838)</b>	<b>Percentage</b>
Verbal violence	2751	72
Emotional violence	1591	41
Physical violence	1157	30
Cultural violence	735	19
Sexual violence	315	8
Online/virtual/cyber harassment	263	7
Other	47	1
<b>Type of aggressor</b>	<b>Count (N=3838)</b>	<b>Percentage</b>
More than one type of aggressor	711	19
Colleague	341	9
Patient	453	12
Patient and relative and/or caregiver	594	15
Patient and relative and/or caregiver	1108	29
Supervisor	610	16
Skipped	21	1
<b>Frequency of violence during COVID-19 pandemic</b>	<b>Count (N=3838)</b>	<b>Percentage</b>
Increased	1404	37
About the same	1657	43
Decreased	747	19
<b>Number of violent episodes in past 1 year</b>	<b>Survey respondent—self (N=2974)</b>	<b>Survey respondent—colleague (N=864)</b>
Every day	53 (2%)	10 (1%)
About once a week	269 (9%)	91 (11%)
A few times a week	184 (6%)	46 (5%)
Once or twice a month	746 (25%)	217 (25%)
Once or twice a quarter	655 (22%)	491 (57%)
Once or twice a year	1048 (35%)	0 (0%)

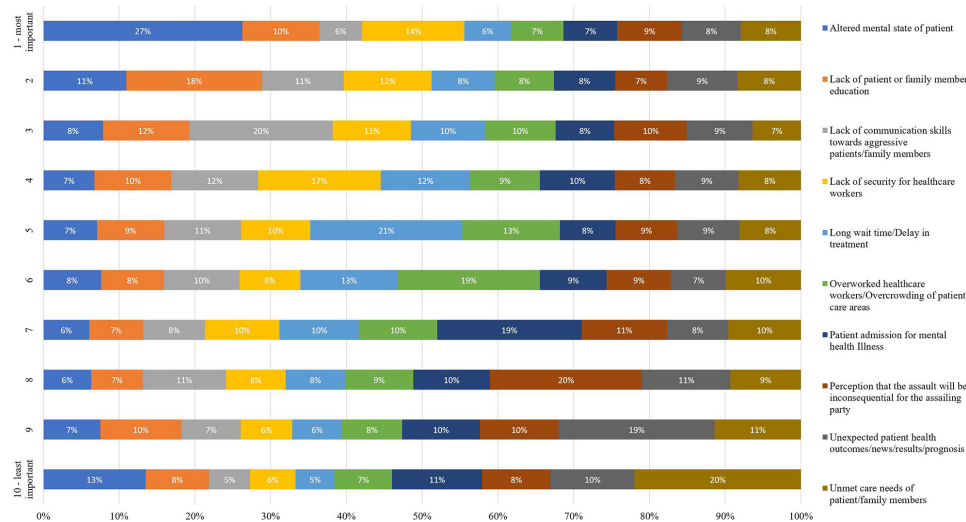
a patient accompaniment (relative or family member) as the most common type of aggressor, whereas 15.9% reported experiencing violence from their supervisors, and 8.9% by their colleagues. Another 18.5% reported more than one type of aggressor (table 2). Around 49% of respondents had reported the violent episode(s) to the hospital administration or the police (online supplemental appendix B—table 3).

#### Frequency of violence

Sizeable differences in the frequency of violence were observed when self-respondents were compared with those reporting against their colleagues. Total of 2974 HCWs reporting violence against themselves, 35.2% described facing violence once or two times a year.

However, none of the 864 HCWs who had witnessed violence against their colleagues reported this frequency of violent incidents. Meanwhile, 56.8% of these 864 HCWs reported a higher frequency of violence, that is, once or two times a quarter, compared with 22% (N<sub>Total</sub>=2974) of self-respondents facing violence during the same interval; nevertheless, 25% of both groups reported facing harassment every month, whereas 2% of self-respondents and 1% of colleague-respondents were victims of daily abuse and violence (table 2).

Out of 3838 respondents, 36.6% reported an increase in the frequency of violence during the COVID-19 pandemic. While 43.2% felt that the frequency of violence had remained unchanged, nearly 19.5% of respondents



**Figure 2** Probable cause of violence as per survey responses—self and colleague.

considered the violence frequency to drop during the COVID-19 pandemic (table 2).

### Cause of violence

Survey respondents were asked to rank the 10 listed probable causes of violence based on their perceived importance. The patient's altered mental status was discerned as the most important cause by 27%, followed by a scarcity of security for HCWs (13.8%) and a paucity of patient or family member education (10.4%). Conversely, 20.4% considered the patient's or family member's unmet care needs the least probable cause. Contrary to the 27% selecting altered mental status as the most critical factor, 12.5% described altered sensorium of the patient as the least essential cause, followed by 11.1% of respondents who held patients admitted with mental illness as the least responsible. A detailed graph of the ten ranking questions is listed in figure 2.

### Violence outcomes and reporting

Of the 5405 survey participants, 51.7% of respondents validated the availability of violence reporting procedures at their institutions. Around 44% of the respondents were aware of the OSHA standards/guidelines. Over 75.3% of survey respondents reported not receiving adequate training to manage a potentially violent event (online supplemental appendix B–table 3).

Most HCWs felt more worried and less prepared to encounter a potentially violent situation. Nearly 62% of the respondents expressed being moderately (Likert scale 3) to very strongly worried (Likert scale 5) about facing a potentially violent situation. On the other hand, more than 75% of respondents felt unprepared at all (Likert scale 1) to moderately prepared (Likert scale 3) to handle a violent situation (online supplemental appendix B–figure 4).

Of the 3838 respondents who reported that either they themselves or their colleague(s) had faced violence, 55.1% reported feeling less motivated or more dissatisfied with their job as an aftermath of violence. Around

16.6% of these reported being willing to quit either their current department or their workplace, and 4.6% to leave the profession. Contrastingly, almost 17.5% of people expressed no change in their attitude towards work, while 5.3% felt more motivated to work than before (online supplemental appendix B–figure 5, online supplemental appendix B–table 3).

### Analysis of possible predictors of violence

#### Univariate analysis

The univariate analysis revealed that female gender was not associated with increased odds of facing violence compared with men (OR=1.04; 95% CI 0.93 to 1.16,  $p=0.46$ ). HCWs in government sectors had higher odds of experiencing violence compared with non-government private sector employees (OR=1.41; 95% CI 1.25 to 1.60,  $p<0.001$ ). Nurses (OR=2.40; 95% CI 1.83 to 3.14,  $p<0.001$ ), physicians (OR=2.23; 95% CI 1.77 to 2.81,  $p<0.001$ ) and other HCWs (eg, emergency medical transport, pharmacists, physical therapist, researchers, etc) (OR=1.73; 95% CI 1.36 to 2.22,  $p<0.001$ ) had significantly higher odds of facing violence, while medical students had significantly lower odds (OR=0.65; 95% CI 0.51 to 0.84,  $p<0.001$ ).

HCWs aged 26–35 years (OR=2.56; 95% CI 2.25 to 2.91,  $p<0.001$ ), 36–45 years (OR=2.68; 95% CI 2.26 to 3.19,  $p<0.001$ ), 46–55 years (OR=2.83; 95% CI 2.18 to 3.67,  $p<0.001$ ) and 55–65 years old (OR=1.83; 95% CI 1.30 to 2.58,  $p<0.001$ ), all exhibited significantly increased odds of facing violence, except for those aged 65 and above (OR=1.67; 95% CI=0.78 to 3.58,  $p=0.19$ ). HCWs with 1–2 years of experience had increased odds of facing violence (OR=1.56; 95% CI=1.27 to 1.92,  $p<0.001$ ), and this trend continued to escalate with 2–5 years (OR=2.27; 95% CI 1.88 to 2.73,  $p<0.001$ ), 6–10 years (OR=2.85; 95% CI 2.32 to 3.51,  $p<0.001$ ), 11–20 years (OR=2.91; 95% CI 2.31 to 3.67,  $p<0.001$ ), 20–30 years (OR=2.59; 95% CI 1.91 to 3.51,  $p<0.001$ ) and more than 30 years (OR=2.02; 95% CI 1.37 to 2.97,  $p<0.001$ ). Additionally, a higher frequency

**Table 3** Univariate and multivariate logistic regression models for the association of socio-demographic variables and self-experienced violence

Variable	Univariate					Multivariate				
	OR	Standard error	95% CI for B		P value	OR	Standard error	95% CI for B		P value
			LL	UL				LL	UL	
Gender*										
Female	1.041	0.057	0.934	1.161	0.461	1.099	0.066	0.977	1.237	0.114
Work setting†										
Public setting	1.410	0.089	1.245	1.597	<0.001	1.427	0.096	1.250	1.629	<0.001
Other	0.882	0.157	0.621	1.252	0.483	0.897	0.170	0.617	1.303	0.569
Profession‡										
Medical student	0.653	0.082	0.510	0.836	0.001	0.776	0.107	0.591	1.020	0.069
Nurse	2.398	0.330	1.831	3.141	<0.001	1.946	0.284	1.461	2.592	<0.001
Physician	2.227	0.263	1.766	2.807	<0.001	1.702	0.213	1.332	2.176	<0.001
Other HCW	1.732	0.219	1.351	2.220	<0.001	1.577	0.210	1.214	2.049	0.001
Age§										
26–35	2.558	0.168	2.250	2.909	<0.001	1.757	0.135	1.510	2.044	<0.001
36–45	2.683	0.238	2.255	3.193	<0.001	1.783	0.182	1.459	2.179	<0.001
46–55	2.829	0.377	2.179	3.672	<0.001	1.981	0.288	1.489	2.636	<0.001
56–65	1.833	0.320	1.302	2.582	0.001	1.256	0.234	0.871	1.810	0.221
65+	1.671	0.649	0.780	3.577	0.187	1.377	0.564	0.616	3.077	0.435
Years of experience¶										
1–2	1.560	0.163	1.270	1.915	<0.001	–	–	–	–	–
2–5	2.266	0.217	1.878	2.734	<0.001	–	–	–	–	–
6–10	2.854	0.302	2.319	3.514	<0.001	–	–	–	–	–
11–20	2.908	0.343	2.306	3.667	<0.001	–	–	–	–	–
21–30	2.591	0.401	1.912	3.510	<0.001	–	–	–	–	–
>30	2.021	0.398	1.373	2.974	<0.001	–	–	–	–	–
Night shift**										
1–2	2.367	0.150	2.090	2.680	<0.001	1.955	0.133	1.710	2.235	<0.001

Values are significant at 0.05.  
 \*Reference *female* category is 'male'.  
 †Reference *work setting* category is 'private'.  
 ‡Reference *profession* category is 'administrative or researcher'.  
 §Reference *age* category is '18–25'.  
 ¶Reference *years of experience* category is '<1'.  
 \*\*Reference *frequency of night shifts* category is 'low'.  
 LL, lower limit; UL, upper limit.

of night shifts correlated with higher odds of violence (OR=2.37; 95% CI 2.09 to 2.68,  $p<0.001$ ) (table 3).

#### Adjusted logistic regression models using gender and work setting as independent predictors for experiencing violence

Based on our a-priori hypothesis, multivariate regression models were developed, taking female gender and government institution type as the independent predictor variables. They were controlled for the same confounding variables, including age, work experience, profession and frequency of night shifts (table 3). Age and years of experience were found to be strongly correlated and, thus, introducing collinearity to the models, so it was decided

to drop years of experience during the model-building process. The first regression analysis examined the relationship between gender and violence risk, revealing that being woman (OR=1.10; 95% CI 0.98 to 1.24,  $p=0.114$ ) was not significantly associated with increased odds of violence. However, working in government institutions (OR=1.43; 95% CI 1.25 to 1.63,  $p<0.001$ ) was significantly associated with an increase in the odds of experiencing violence.

Furthermore, being a nurse (OR=1.95; 95% CI 1.46 to 2.59,  $p<0.001$ ), physician (OR=1.70; 95% CI 1.33 to 2.18,  $p<0.001$ ) or other HCWs (OR=1.58; 95% CI 1.21 to 2.05,



$p < 0.001$ ) was significantly associated with higher odds of violence when controlled for other variables. Regarding age, individuals aged 26–35 years (OR=1.76; 95% CI 1.51 to 2.04,  $p < 0.001$ ), 36–45 years (OR=1.78; 95% CI 1.46 to 2.18,  $p < 0.001$ ) and 45–55 years (OR=1.98; 95% CI 1.49 to 2.64,  $p < 0.001$ ) had increased odds of violence. However, age groups 55–65 years (OR=1.26; 95% CI 0.87 to 1.81,  $p = 0.221$ ) and 65+ years (OR=1.38; 95% CI 0.62 to 3.08,  $p = 0.435$ ) did not show a significant association. Additionally, the frequency of night shifts (OR=1.96; 95% CI 1.71 to 2.24,  $p < 0.001$ ) was significantly associated with increased odds of violence (table 3).

### Association between gender and violence subtypes experienced by study participants

We analysed the association between HCWs' gender and subtypes of violence. No significant difference was observed in the proportions of verbal violence between men and women (51% vs 50.8%;  $\chi^2$ : 0.02;  $p = 0.900$ ). However, female gender was found to be associated with a significantly higher proportion of emotional violence (30.6% vs 28%;  $\chi^2$ : 4.15;  $p = 0.042$ ) and sexual violence (7.4% vs 3.8%;  $\chi^2$ : 31.50;  $p = 0.001$ ) compared with male counterparts. Male HCWs, on the other hand, were exposed to a statistically significantly higher proportion of physical abuse when compared with their female counterparts (24.2% vs 19%;  $\chi^2$ : 20.72;  $p = 0.001$ ) (online supplemental appendix B–table 4)

## DISCUSSION

In this global survey of >5000 HCWs, more than half of HCWs reported experiencing violence firsthand, and one-sixth reported witnessing violence against their colleague(s). Verbal violence was the most common, followed by emotional violence. Patients or their family members were described as the perpetrator in more than half of the cases, whereas one-sixth of the HCWs reported facing aggression from their supervisors. Furthermore, more than half of the HCWs who experienced violence felt less motivated or more dissatisfied with their job after the event. Finally, the univariate and multivariate regression models found that government institutions, increasing age, more frequent night shifts, and being a nurse, physician or any other HCW were associated with a significantly increased risk of experiencing violence. On the other hand, the female gender was not associated with increased violence risk in both the univariate analysis and when controlled for various confounders. Our analysis also reported that male HCWs were more susceptible to physical abuse, while female HCWs were more likely to experience emotional abuse and sexual harassment.

In our study, most responses came from India, the USA, Venezuela, Pakistan and Algeria (online supplemental appendix B–table 2). This could be because the highest number of, and the most active, country leads belonged to these regions. While a Chinese hospital association report

(2012), including data from 316 hospitals, showed that a substantial 96% of the hospitals in China had reported cases of WPV, despite our multiple attempts, we could only receive a small number of responses from China, limiting our ability to perform a head-on comparison.<sup>29</sup>

Our study showed that violence among HCWs is prevalent among young adults (75%) with similar distribution among female and male gender. This was analogous to Alshahrani *et al* findings in a cross-sectional study of several emergency departments in Saudi Arabia.<sup>30</sup> More than 90% of respondents in their study belonged to the 20–39 age group, with an equal gender distribution among the 492 respondents. They also reported that 80% of the respondents confirmed the presence of violence reporting procedures in their institutions, and only one-third of the respondents had not used any of these measures. On the contrary, our study found that although >50% of the respondents had confirmed the availability of violence reporting systems in their institutions, <50% of the respondents mentioned reporting violent conduct to either their institution's administration or the police.

Every two out of three respondents in our study had experienced violence, either against themselves or witnessed against a colleague. The Chinese Medical Doctors Association reported that more than three-fourths of the involved physicians had experienced some form of violence at work.<sup>31</sup> Byon *et al* conducted a meta-analysis to estimate the prevalence of WPV against HCWs and found it to be 22%. Of these, 36% of the incidents involved non-physical acts of violence, while 10% caused physical harm to the HCW.<sup>32</sup> A similar trend was observed in our study, where verbal violence was reported as the most typical form of violence. Other previous studies have also reported analogous results, with non-physical violence (especially verbal violence) being the most prevalent form of violence against HCWs.<sup>30–33</sup> Our findings also show that more than half of the respondents reported the patients or their family members as the perpetrators of aggression. Contrastingly, nearly 15% of respondents reported being victims to their supervisors, and 10% of respondents were mistreated by their colleagues. Some studies also reported patients and their family members as the most common type of aggressors, thus supporting our findings,<sup>34–36</sup> whereas, in a few other studies, other physicians and staff were also found to have contributed to violence against fellow HCWs.<sup>37–39</sup>

Based on the International Committee of the Red Cross data, more than 600 violence cases were reported against HCWs in the first 6 months of the COVID-19 pandemic.<sup>40</sup> In a systematic review of studies about violence against HCWs, Chirico *et al* also observed a high prevalence of violence against HCWs during the COVID-19 pandemic. They concluded that the risk of suffering such an episode by an HCW was excessively high during the pandemic.<sup>41 42</sup> A crowded and less conducive hospital environment (during the pandemic) can induce stress for HCWs and patients or their families, thus risking

increased violence against HCWs.<sup>41 43</sup> In our study, every third respondent reported an increase in frequency during the pandemic, while a minority of HCWs reported a decrease in violence frequency.

Violence is associated with mental health issues such as traumatic memories, severe stress/anxiety, fear of unpredictability, etc.<sup>44</sup> Studies suggest that patients with altered mental status, such as dementia, mental retardation, drug and substance abuse or other psychiatric disorders, are at a higher risk of inciting violence against HCWs.<sup>45 46</sup> In other studies, an insufficient number of HCWs, poor communication between patients or families and healthcare providers or among healthcare providers and unmet care needs of patients or families were reported as the most important causes of violence.<sup>39 47 48</sup> Comparatively, in our study, nearly 25% of the respondents described the altered mental status of patients as the most important cause of violence, 15% described the lack of HCW security, and 10% reported a lack of patient or family member education as the leading cause.

More than half of the respondents in our study reported feeling less motivated or more dissatisfied with their job in the aftermath of experiencing violence; some were willing to quit their current department or workplace, while some HCWs considered leaving the profession entirely. In congruence with our findings, a study by Rafea *et al* reported that 26% of the HCWs considered leaving their job because of experiencing WPV.<sup>49</sup> This could be attributed to the impact of violence, which manifests as decreased productivity and concentration, impaired quality of work, higher use of defensive medicine and psychological consequences (over-stress, depression or Post Traumatic Stress Disorder (PTSD)), ultimately affecting the quality of patient care.<sup>48 50–52</sup> Recently, several recommendations have been proposed to curb violence against HCWs to protect and enhance their mental health.<sup>53</sup>

Several studies have examined the association between HCW gender and the risk of experiencing violence. Some studies have found no difference in exposure to any kind of violence based on gender, similar to our logistic regression analysis,<sup>54–56</sup> whereas others have found that male HCWs may face higher odds of violence.<sup>57 58</sup> Conversely, female HCWs have been found to be more likely to experience any form of violence in some studies, with gender being a significant predictor of violence even after adjusting for possible confounders like age.<sup>34 59–61</sup>

The regression analysis in our study found that female HCWs are more likely to face sexual harassment, while men are more likely to experience physical violence. These findings match with patterns seen in previous studies conducted in China (adjusted OR=2.3) and the USA (OR=1.6), which found that male HCWs were more likely to face physical violence.<sup>62 63</sup> On the other hand, Jatic *et al* found that female HCWs were more likely to face sexual harassment (OR=2.06).<sup>60</sup>

Liu *et al*'s meta-analysis and a study from China reported that nurses and physicians were more likely to face WPV

than other healthcare professions.<sup>54</sup> In contrast, two studies reported that support staff, including ambulance drivers and security officers, were at an increased risk of violence.<sup>61 64</sup> Our study found that HCWs, including physicians, nurses and auxiliary staff, are at a higher risk of encountering violence.

The relationship between age and the risk of WPV against HCWs) is inconsistent across studies. A US-based study and the current study found that increasing age is associated with higher odds of physical and psychological violence against HCWs.<sup>63</sup> In contrast, the European Nurses' Early Exit (NEXT) study found that increasing age decreases the odds of being attacked at the workplace,<sup>57</sup> whereas Wu *et al* observed no association between age and the risk of WPV among physicians.<sup>56</sup>

The logistic analysis in our study is in line with Campbell *et al*'s study, with a significantly increased risk of violence for HCWs with greater work experience, contradictory to a few other studies, which suggest the opposite.<sup>59 63</sup> Assessing the association between healthcare facility type and violence, one study from the Democratic Republic of Congo found no significant difference in verbal, physical and sexual violence risk between government and private healthcare facilities.<sup>65</sup> In contrast, a study from Pakistan reported a lower likelihood of WPV in private healthcare settings, concurring with our study results.<sup>66</sup>

Similar to our analysis, various studies conducted in different countries indicate that HCWs who work solely night shifts or shift work with night duties are at a higher risk of experiencing WPV, including physical and verbal violence, compared with those who work regular day shifts.<sup>57 67 68</sup> It is important to note that our regression models were not designed to test variables as the main predictors. This might lead to incomplete control of the potential confounders. Thus, interpretation of all the above results must be done carefully.

The implications for policymakers from our study are significant. It is crucial to address the psychological impact of WPV on HCWs, leading to burnout syndrome, impaired work ability, PTSD and even retirement. Comprehensive strategies should be implemented to prevent and manage WPV, including the development of protocols and guidelines, ensuring the safety of HCWs and providing psychological support programmes tailored to their needs. The establishment and strengthening of OSHA to make it uniformly accessible worldwide to support HCWs affected by violence should be prioritised.<sup>69</sup> Second, policymakers should invest in training programmes and educational initiatives to raise awareness about WPV and its impact on healthcare professionals.<sup>70</sup> A strong focus should be on mitigating the added stressors HCWs face, such as excessive workloads, shortage of staff, high demands and long working hours, by implementing measures like enhanced benefits, flexible work arrangements and resiliency training programmes.<sup>71</sup> By creating a culture of safety and zero tolerance for violence, healthcare organisations can promote the well-being of HCWs, ultimately improving the quality of patient care.

There are several strengths of our study. This is the largest global study on violence against HCWs involving >5000 HCWs. The deidentified survey response collection promoted honest and reliable responses that may have represented the actual situations. The study was non-funded and was conducted with the help of volunteers across the globe. Also, the speed of data collection in 8 weeks is another major highlight of our study.

However, we acknowledge a few limitations to the study. We used convenience sampling based on participants' willingness and availability to take the survey, which might have increased the volunteer bias. We could be more inclusive to get more responses per country and include other countries from the South America and European continents. Also, it is a cross-sectional design, which did not allow us to describe the prevalence of WPV. The responses in our study included HCWs with diverse backgrounds and cultures, which could lead to self-reporting bias. To negate this to a certain extent, 106 respondents from 31 countries were excluded because of incomplete responses, missing demographics or less than 10 responses per country. Also, there is a chance of bias in the 10-point ranking questions. Some respondents might have chosen the top-listed responses as a high priority, as they were in alphabetical order. Thus, the result should be taken with a grain of salt. Finally, the survey was conducted only in English, except for verbal translation guidance in Spanish and Arabic, which could lead to a language barrier among non-English speakers.

## CONCLUSION

Apart from reaffirming the global presence of violence against HCWs, the ViSHWaS survey-based study highlighted the significance of varied forms of violence, including verbal and emotional violence. The outcome concerning the diminished morale of the HCWs and the fear of non-preparedness for a violent episode warrants attention. Notably, increased perception of violence in the light of the COVID-19 pandemic has further enhanced the need for reforms within. The HCWs need to be protected and provided with tools and training to improve stress management associated with violence in the workplace. Further studies based on large-scale analysis over a longer duration with participation from non-English speaking nations are required to build an accurate estimate of the current state of violence in health-care.

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