La Medicina del Lavoro

Original article

Med. Lav. 2025; 116 (4): 16795
DOI: 10.23749/mdl.v116i4.16795

Gender Disparities in Workplace Violence Among Italian Healthcare Workers: A Cross-Sectional Study

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Keywords: Workplace Violence; Gender Disparities; Transgender & Gender Expansive; Healthcare Workers; Workplace Safety

Abstract

Background: *Workplace violence (WPV) is a prevalent issue globally among Healthcare Workers (HCWs). Moreover, WPV may disproportionately impact marginalized groups within the healthcare workforce, such as women and gender minorities. This study aims to examine the prevalence of WPV experienced by HCWs through a gender-focused lens and to investigate factors influencing the risk of WPV.* **Methods:** *A cross-sectional observational study was conducted over a month in Apulia, Italy, involving employees from major healthcare institutions, including hospitals, Local Health Authorities, selected correctional facilities, and Residences for Execution of Security Measures. The study used the Italian-validated WHO Workplace Violence in the Health Sector questionnaire, modified to include 'Other' in the gender definition.* **Results:** *3,259 HCWs participated, representing 88.8% of the 3,670 invited participants. The prevalence of violence incidents within the last 12 months was 29.6% in the HAW group and 57.1% in the CRW group. Within the HAW group, transgender and gender expansive (TGE) workers exhibited a higher prevalence of verbal, physical, and sexual harassment. Logistic regression analysis identified gender, job type, night shifts, interactions with specific patients, and the type of medical settings as significant predictors of experiencing various kinds of violence.* **Conclusions:** *The study underscores the vulnerability of TGE and female HCWs to workplace violence. These findings underscore the imperative for comprehensive yet gender-sensitive interventions promoting safety, equity, and inclusion in the healthcare workplace.*

1. Introduction

Workplace violence (WPV) has been defined by the National Institute for Occupational Safety and Health (NIOSH) as an act or threat of violence at the workplace or against persons in charge. It includes verbal abuse, psychological harm, physical or sexual harassment, and cyber persecution [1]. Healthcare workers (HCWs) face an increased risk of WPV exacerbated by heavy workloads, stress, and societal pressures, with reports showing a surge in violence during the COVID-19 pandemic [2-4].

Received: 20.01.2025 – Accepted: 10.06.2025
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Despite the healthcare sector's vulnerability to violence, effective methods for risk reduction have not been statistically established. WPV can result in injuries, psychological distress, and occupational issues like work overload and decreased job satisfaction, leading to high absenteeism, medical errors, and organizational performance decline [5, 6]. However, although aggressive acts are broadly impacting in the healthcare setting, they are still underreported for several reasons, including the stigma of victimization, the threat of further violence, the risk of desensitization to violence that may be perceived as a part of the HCWs job [7], The impact of WPV can be particularly severe within vulnerable working populations, such as women and gender minorities.

Global surveys consistently show that female HCWs are disproportionately affected by WPV and are more likely to underreport incidents compared to their male counterparts [8-10]. Furthermore, current assessments of the risk of WPV have not adequately considered diverse gender identities, including transgender and/or gender-expansive (TGE) workers. This umbrella term encompasses all gender identities that extend beyond the traditional binary framework, such as nonbinary, agender, or genderqueer [11].

There is limited understanding of the experiences of transgender and gender expansive (TGE) medical professionals. However, WPV against healthcare workers may stem from the stigmatization of gender non-conformity and gender expression by colleagues and/or patients [12]. TGE physicians often hide their identity due to fears of discrimination, with few institutions having policies addressing this. This distress and lack of inclusivity can lead to a lack of psychological and physical safety [13]. Although tools have been developed to measure WPV [14], they are not commonly utilized in health facility surveys. Consequently, it is crucial to investigate how gender-related factors influence practices and interactions in healthcare settings. From a gender-related perspective, our study aims to address the prevalence of HCWs experiencing WPV in healthcare settings, investigate the factors that impact this risk according to HCWs' gender, identify barriers and facilitators to inclusion, and suggest strategies to promote an inclusive healthcare workplace.

2. Methods

2.1. Study Design

A cross-sectional observational study was conducted from November 20, 2023, to December 20, 2023. The study was conducted in all 10 prominent healthcare institutions in Apulia (Southern Italy), operating within the framework of the National Health Service, and in six local health authority (ASL) services. Each ASL is a body with public legal personality and entrepreneurial autonomy that includes hospital facilities and different types of ambulatory and territorial sanitary services. Moreover, HCWs from three correctional facilities previously described by Stufano et al. (2021) [15] and from two Residences for the Execution of Security Measures (REMS), healthcare services provided by the Italian Law 81/2014 to accommodate persons suffering from mental disorders, perpetrators of crimes, to whom the Court applies the custodial security measure, all placed in Apulia, were asked to participate in the survey.

Following a training meeting on violence against HCWs, the occupational physicians of each healthcare facility included in the survey joined the trial. All the HCWs called by the Occupational Health Service of each facility during the study period for the mandatory health surveillance periodic visit, according to the Italian Law concerning the protection of workers' health (D. Lgs. 81/2008), were recruited for voluntary participation in the study. Differently, all the HCWs from correctional facilities and REMS were invited to participate in the survey voluntarily by the respective ASL management.

2.2. Study Population

The study included HCWs aged 18 years and older who had been employed in the same healthcare facility for at least the previous 12 months. Given the specific characteristics of the setting in which prison and REMS HCWs operate, all the subsequent analyses have been performed subdividing the HCWs in those operating in the hospital and ASL services (Group 1: Hospital and

ASL workers - HAW) and those operating in correctional and REMS facilities (Group 2: Correctional and REMS workers - CRW). Moreover, HCWs were divided into three main occupational groups: physicians, nurses, and "Other Healthcare Professionals and Employees in Related Services" (OHPERS). Participation was anonymous and voluntary. The principles of ICH Good Clinical Practice, the 'Declaration of Helsinki', and national and international ethical guidelines were strictly followed during this study. The research was approved by the Bari University Hospital Ethics Committee (Protocol N. 6663, 2021).

2.3. Questionnaire

The study used the validated version of the WHO Workplace Violence in the Health Sector Country Case Studies Research Instruments Survey (WVHS) questionnaire for the Italian population [16, 17]. The questionnaire collected self-reported information on WPV in the previous 12 months. The original WVHS questionnaire includes a binary categorization of sex (male, female). In our study, aiming to inclusively capture experiences that might reflect gender diversity beyond traditional binary definitions, we introduced an additional response option labeled 'Other'. Given practical constraints related to questionnaire length and structure, we did not include a more detailed gender identity assessment or a 'prefer not to answer' option. While this approach helps to highlight potential vulnerabilities of HCWs who identify themselves outside the binary categories, it is acknowledged as an exploratory categorization rather than a comprehensive representation of the diversity within TGE identities.

Due to the sensitive nature of the questions, the questionnaire was administered digitally for self-completion rather than through direct interviews to ensure the confidentiality and discretion of the anonymous participants. Subsequently, the questionnaire was adapted into an online format using Google™ Docs. Workers completed questionnaires in a separate room while waiting for medical examination; the occupational physician was unaware of the workers' decision.

2.4. Data Analysis

Descriptive statistics were computed using IBM SPSS Statistics, Version 24. Given the categorical nature of the data, $\chi 2$ tests were employed to investigate gender disparities, followed by effect-size computations (Phi and Cramer's V) to gauge the practical significance of these disparities. Chi-square tests were applied to compare categorical variables between groups. In contrast, Fisher's exact test was used whenever the expected cell frequency was less than five to ensure accuracy and reliability, particularly in analyses involving the smaller TGE subgroup. As a post hoc analysis, standardized Pearson residuals (referred to as SPRs henceforth) were computed for each cell to identify which cell differences contributed to the results of the $\chi 2$ tests. A significance level was set at 0.05.

A logistic regression model was constructed to assess the predictors of the different types of violence against HCWs. In our a priori hypothesis, gender (male, female, or other) and job (physician, nurse, or OHPERS) were identified as primary predictors. Binary logistic regressions were conducted to examine the impact of both primary (independent) and secondary predictors on the likelihood of violence against HCWs.

3. Results

Of 3,670 HCWs invited to participate in the study, 3259 HCWs were recruited from various healthcare facilities (88.8%), with 3189 belonging to the HAW group and 70 to the CRW group. Table 1 illustrates the demographic and job-related traits of HCWs enlisted in the two healthcare settings investigated (HAW and CRW), categorized by gender. There was a notable contrast in gender distribution across the three job categories (physicians, nurses, and OHPERS) examined in both workplace settings ($p<0.001$ and $p=0.048$, respectively).

The overall prevalence of HCWs reporting violence incidents in the last 12 months was 29.6% in the HAW setting, lower than the 57.1% observed in the CRW setting (Figure 1).

Table 1. Characteristics of recruited subjects are subdivided according to gender and the working set.

	HAW (n. 3189)				RCW (n. 70)			
Variables	**Men (n 1119) N (%)**	**Women (n 2026) N (%)**	**TGE (n 44) N (%)**	**p-value**	**Men (n 32) N (%)**	**Women (n 36) N (%)**	**TGE (n 2) N (%)**	**p-value**
Age (years)								
- 20 - 24	9 (0.8)	37 (1.8)	0 (0.0)	p<0.001	0 (0.0)	0 (0.0)	*	p<0.001
- 25 - 29	123 (11.0)	263 (13.0)	4 (9.1)		2 (6.3)	2 (5.6)		
- 30 - 34	147 (13.1)	235 (11.6)	10 (22.7)		5 (15.6)	3 (8.3)		
- 35 - 40	128 (11.4)	188 (9.3)	3 (6.8)		7 (21.9)	5 (13.9)		
- 40 - 44	96 (8.6)	203 (10.0)	1 (2.3)		2 (6.3)	4 (11.1)		
- 45 - 49	118 (10.5)	255 (12.6)	7 (15.9)		4 (12.5)	6 (16.7)		
- 50 - 54	144 (12.9)	317 (15.6)	5 (11.4)		2 (6.3)	7 (19.4)		
- 55 - 59	159 (14.2)	311 (15.4)	7 (15.9)		6 (18.8)	6 (16.7)		
- 60+	195 (17.4)	217 (10.7)	7 (15.9)		4 (12.5)	3 (8.3)		
Job								
- Physician	321 (28.7)	389 (19.2)	7 (15.9)	p<0.001	5 (15.6)	9 (25.0)	*	p=0.048
- Nurse	374 (33.4)	989 (48.8)	12 (27.3)		5 (15.6)	10 (27.8)		
- Other	424 (37.9)	648 (32.0)	25 (56.8)		22 (68.8)	17 (47.2)		
Marital Status								
- Married	599 (53.5)	1029 (50.8)	14 (31.8)	p<0.001	17 (53.1)	24 (66.7)	*	NS
-Cohabitant	171 (15.3)	273 (13.5)	4 (9.1)		6 (18.8)	2 (5.6)		
- Divorced	68 (6.1)	173 (8.5)	2 (4.5)		1 (3.1)	3 (8.3)		
- Single	273 (24.4)	519 (25.6)	23 (52.3)		8 (25.0)	7 (19.4)		
- Widowed	8 (0.7)	32 (1.6)	1 (2.3)		0 (0.0)	0 (0.0)		
Working seniority								
- 1 - 5	289 (25.8)	546 (26.9)	14 (31.8)	NS	15 (46.9)	8 (22.2)	*	NS
- 6 - 10	142 (12.7)	254 (12.5)	6 (13.6)		4 (12.5)	7 (19.4)		
- 11 - 15	119 (10.6)	200 (9.9)	6 (13.6)		6 (18.8)	6 (16.7)		
- 16 - 20	138 (12.3)	242 (11.9)	6 (13.6)		0 (0.0)	7 (19.4)		
- 20+	431 (38.5)	784 (38.7)	12 (27.3)		7 (21.9)	8 (22.2)		
Night Shift	738 (66.0)	1203 (59.4)	25 (56.8)	p<0.001	23 (71.9)	14 (38.9)		p=0.011

**Demographic data for TGE participants in the CRW group have been excluded to protect anonymity due to the small sample size (n=2).*

The main characteristics of the acts of violence experienced by the two groups of recruited HCWs according to gender are shown in Table 2.

In the HAW, a significantly higher percentage of TGE workers were found to be victims of violent incidents in the last 12 months (36.4% vs. 31.6% women and 25.0% men). Specifically, TGE workers were victims in significantly higher percentages than female and male workers of episodes of verbal violence (45.5% vs. 38.2% and 33.6%, respectively, p=0.01) and sexual harassment (9.1% vs 0.9% and 0.3%, p<0.001). TGE and female workers also experienced a higher percentage than male psychological violence (15.9% vs 15.6% and 11.5%, respectively, p=0.006). Regarding the types of the aggressor, significantly higher percentages of TGE than male and female HCWs experienced violence from colleagues (15.9% vs. 9.1% and 6.3%, p=0.004) or from directors (9.1% vs. 6.4% and 3.8%, p=0.006), whereas no significant differences were found among genders in

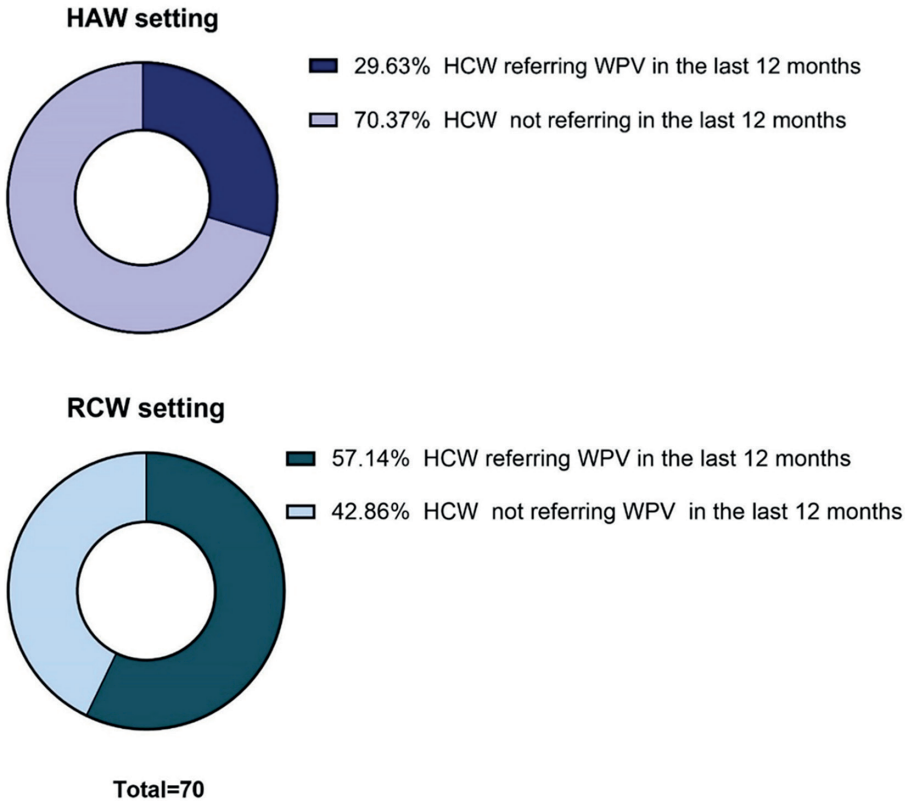

Figure 1. Overall prevalence of incidents of workplace violence (WPV) in health care workers (HCWs) working in hospitals and ASL (HAW) and in the prison and REMS settings (RCW).

their experience of assaults perpetrated by patients, patient relatives or the general public.

In the CRW setting (Table 2), no significant differences were found among the three genders in the experience of both total and specific types of violence incidents that occurred in the past 12 months, except that male HCWs experienced significantly higher rates of physical violence and weapon violence incidents than female and TGE workers (both 62.5% vs. 22.2% and 50.0%, p=0.003). Finally, management or the general public reported no violence perpetrated in the past year. In contrast, a significantly higher percentage of male than female or TGE workers experienced violence from patients (68.6% vs 38.9% and 50.0%, p=0.04). Lastly, a significantly higher percentage of TGE workers experienced violence from coworkers in the past year than male and female workers (50% vs 6.3% and 2.8%, p=0.02).

Logistic regression analysis showed significant models for the likelihood of experiencing all four types of violence investigated (p<0.001 for all) for HAW (Tables 3a and 3b). In contrast, no significant model was observed for CRW (data not shown).

Gender influences the probability of experiencing all types of violence. Compared to males, TGE HCWs showed a statistically significant increase in the odds of experiencing verbal violence (OR 2.06, p=0.026), physical violence (OR 2.04, p=0.045), and sexual harassment (OR 51.62, p<0.001). Moreover, female HCWs showed increased ORs than males for verbal violence (OR 1.23, p=0.012), sexual harassment (OR 4.50, p=0.021), and psychological violence (OR 1.45, p=0.001).

Regarding the job, there was no statistically significant difference in the odds of experiencing any violence for nurses compared with physicians. In contrast, OHPERS were less likely to experience

Table 2. Characteristics of workplace violence (WPV) incidents in the last 12 months in the recruited HCWs, subdivided according to gender and working setting.

	HAW (n. 3189)				RCW (n. 70)			
Variables	**Men (n 1119) N (%)**	**Women (n 2026) N (%)**	**TGE (n 44) N (%)**	**p-value**	**Men (n 32) N (%)**	**Women (n 36) N (%)**	**TGE (n 2) N (%)**	**p-value**
HCW referring WPV incidents in the last 12 months.	288 (25.7)	641 (31.6)	16 (36.4)	p= 0.001	21 (65.6)	17 (47.2)	2 (100.0)	NS
- Physical	213 (19.0)	357 (17.6)	13 (29.5)	NS	20 (62.5)	8 (22.2)	1 (50.0)	p= 0.003
- Verbal	376 (33.6)	773 (38.2)	20 (45.5)	p= 0.01	23 (71.9)	17 (47.2)	2 (100.0)	NS
- Psychological	129 (11.5)	317 (15.6)	7 (15.9)	p= 0.006	8 (25.0)	9 (25.0)	1 (50.0)	NS
- Sexual harassment	3 (0.3)	19 (0.9)	4 (9.1)	p<0.001	0 (0.0)	0 (0.0)	0 (0.0)	NS
Violence with a weapon (last incident)	202 (18.1)	344 (17.0)	12 (27.3)	NS	20 (62.5)	8 (22.2)	1 (50.0)	p= 0.003
Aggressor								
- Patient	211 (18.9)	422 (20.8)	6 (13.6)	NS	22 (68.8)	14 (38.9)	1 (50.0)	p= 0.048
- Patient 's relatives	193 (17.2)	360 (17.8)	9 (20.5)	NS	2 (6.3)	0 (0.0)	0 (0.0)	NS
- Colleague	70 (6.3)	184 (9.1)	7 (15.9)	p=0.004	2 (6.3)	1 (2.8)	1 (50.0)	p= 0.02
- General public	18 (1.6)	39 (1.9)	1 (2.3)	NS	0 (0.0)	0 (0.0)	0 (0.0)	NS
- Management	43 (3.8)	130 (6.4)	4 (9.1)	p=0.006	0 (0.0)	0 (0.0)	0 (0.0)	NS

verbal violence (OR 0.69, p<0.001), physical violence (OR 0.74, p=0.024), and psychological violence (OR 0.63, p=0.002).

The logistic regression analysis also showed that working during night shifts was associated with higher odds of verbal (OR 1.40, p<0.001) and physical (OR 1.86, p<0.001) violence. Moreover, dealing with elderly patients was associated with higher odds of verbal (OR 1.78, p<0.001) and psychological (OR 1.47, p=0.001) violence, whereas dealing with newborn/infants was associated with a higher probability of experiencing psychological violence (OR 1.85, p=0.002).

Regarding the type of medical setting, HCWs performing care work in mental disability showed a higher probability of experiencing all the types of violence investigated, namely verbal (OR 1.41, p=0.006), physical (OR 1.53, p=0.003), sexual harassment (OR 3.95, p=0.008) and psychological (OR1.43,p=0.022).Moreover,workinginaworkplace health and safety setting showed a higher probability of experiencing physical violence (OR 1.53, p=0.028), sexual harassment (OR 3.57, p=0.043), and psychological violence (OR 1.53, p=0.045). Finally, working in a psychiatric setting showed higher odds for both verbal (OR 2.14, p<0.001) and physical (OR 2.60, p<0.001) violence. In contrast, geriatric settings showed a higher experience of verbal violence (OR 1.27, p=0.019) and home care settings of sexual harassment (OR 6.03, p=0.005). A lower probability of experiencing physical violence was observed for physical disability (OR 0.76, p=0.013) and HIV/AIDS (OR 0.48, p=0.012) settings.

4. Discussion

Our study reveals heightened cross-gender identity violence against transgender and gender expansive (TGE) healthcare workers (HCWs), facing increased risks of verbal abuse, psychological aggression, and sexual harassment. Additionally, the study identifies occupational factors such as night shifts and employment in specific healthcare settings, including psychiatric and geriatric care, as significant

Table 3a. The stepwise logistic regression analysis showed an association between verbal and physical violence and demographic and occupational characteristics of the HAW.

	Verbal Violence				Physical Violence			
Variables	**B (SE)**	**OR**	**95% C.I.**	**p-value**	**B (SE)**	**OR**	**95% C.I.**	**p-value**
Gender								
- Male		1				1		
- Female	0.2(0.08)	1.23	1.05- 1.45	p= 0.012	-0.1(0.1)	0.89	0.73-1.09	p= 0.265
- TGE	0.7(0.3)	2.06	1.09- 3.91	p= 0.026	0.7(0.3)	2.04	1.02-4.10	p= 0.045
Occupation								
- Physician		1				1		
- Nurse	0.1(0.1)	1.15	0.95- 1.40	p= 0.165	0.9(0.1)	1.10	0.87-1.40	p= 0.437
- OHPERS	-0.3(0.1)	0.69	0.56-0.85	p< 0.001	-0.3(0.1)	0.74	0.57-0.96	p= 0.024
Night shift	0.3(0.08)	1.40	1.18- 1.65	p< 0.001	0.6(0.1)	1.86	1.50-2.31	p< 0.001
Type of patients dealing with								
- Elderly	0.5(0.08)	1.78	1.50- 2.11	p< 0.001	-	-	-	NS
- Adults	-	-	-	NS	-0.3(0.1)	0.69	0.54-0.89	p=0.004
Type of medical setting								
- Mental disability	0.3(0.1)	1.41	1.10- 1.79	p= 0.006	0.4(0.1)	1.53	1.16-2.03	p= 0.003
- Workplace health and safety	-	-	-	NS	0.4(0.1)	1.53	1.05-2.24	p= 0.028
- Physical disability	-	-	-	NS	-0.2(0.1)	0.76	0.61-0.94	p= 0.013
- HIV/ AIDS	-	-	-	NS	-0.7(0.2)	0.48	0.28-0.85	p= 0.012
- Psychiatry	0.7(0.1)	2.14	1.55-2.96	p< 0.001	0.9(0.1)	2.60	1.86-3.64	p< 0.001
- Geriatrics	0.2(0.1)	1.27	1.04- 1.56	p= 0.019	0.08(0.1)	-	-	NS
Overall model		χ^2:293.6; p<0.001				χ^2:171.2; p<0.001		

predictors of violence. Violence against HCWs is prevalent globally, with the WHO reporting a 38% incidence rate throughout their careers, 16 times higher than in other professions. European HCWs face exceptionally high risks, with 36.6% experiencing non-physical and 20.1% experiencing physical workplace violence (WPV) over 12 months, varying by sociocultural factors and health system characteristics [18]. In Italy, WPV prevalence fluctuates from 11.9% to 93.3%, highlighting the urgent need for interventions to address this pervasive issue in hospitals, clinics, and community health facilities [19].

However, comparing WPV prevalence across European countries is hindered by diverse data collection methods, ranging from self-reports to workers' compensation claims, often excluding public health facilities. Surveys may have low response rates, small samples, and may focus solely on patient and visitor aggression, neglecting worker-on-worker violence, despite its sometimes higher occurrence rates [20-23]. The results emerging from our study show that TGE HCWs may face higher levels of WPV compared to their male and female colleagues, showing a significant increase in the odds of experiencing verbal and physical violence and sexual harassment. In addition, HCWs identifying with a nonbinary gender reported a significantly higher percentage of violence perpetrated by colleagues and management. Several studies have considered the variable of gender in the analysis of risk factors for violence against HCWs [22, 24]. However, this is the first study with a comparative analysis of workplace violence among nonbinary gender-identifying workers, often overlooked in research focusing on binary gender categories.

Table 3b. Association between sexual harassment and psychological violence and demographic and occupational characteristics of the HAW performed by the stepwise logistic regression analysis.

	Sexual Harassment				Psychological Violence			
Variables	**B (SE)**	**OR**	**95% C.I.**	**p-value**	**B (SE)**	**OR**	**95% C.I.**	**p-value**
Gender								
- Male		1				1		
- Female	1.5(0.6)	4.50	1.25- 16.13	p= 0.021	0.3(0.1)	1.45	1.16- 1.83	p= 0.001
- TGE	3.9(0.8)	51.62	9.74- 273.59	p<0.001	0.5(0.4)	1.72	0.74- 4.01	p= 0.209
Occupation								
- Physician						1		
- Nurse	-	-	-	NS	- 0.7(0.1)	0.93	0.72- 1.20	p= 0.577
- OHPERS					- 0.4(0.1)	0.63	0.47- 0.84	p= 0.002
Type of patients dealing with								
- Newborns/ Infants	-	-	-	NS	0.6(0.1)	1.85	1.26- 2.72	p= 0.002
- Elderly					0.3(0.1)	1.47	1.16- 1.86	p= 0.001
Type of medical setting								
- Mental disability	1.3(0.5)	3.95	1.43- 10.91	p= 0.008	0.3(0.1)	1.43	1.05- 1.95	p= 0.022
- Homecare	1.7(0.6)	6.03	1.72- 21.14	p= 0.005	-	-	-	NS
- Workplace health and safety	1.2(0.6)	3.57	1.04- 12.21	p= 0.043	0.4(0.2)	1.53	1.01-2.33	p= 0.045
Overall model		χ^2:142.6; p<0.001				χ^2:71.5; p<0.001		

TGE people are stigmatized in Western societies characterized by a binary gender system [25], and most of them report experiencing discrimination, prejudice, and violence within a range of social institutions, including workplaces [26]. Social stigma and misconceptions about gender diversity may contribute to hostility and aggression toward TGE HCWs, making them more susceptible to verbal abuse, physical assault, and other forms of violence [27, 28]. TGE individuals in diverse workplaces may encounter verbal harassment due to misgendering and challenges with gender-specific dress codes that conflict with their identity, risking discrimination and violence if these rules are disregarded [29]. Specifically, most TGE physicians highlight prominent stigma among colleagues, 11 and a dearth of gender-inclusive physical spaces, such as all-gender restrooms. Trans-inclusive organizational cultures are not uniform across the spectrum of employment, and inadequate training programs related to TGE inclusivity in healthcare facilities may fail to address the safety concerns of TGE people, further exacerbating the risk of experiencing WPV [30].

In line with other recent reports, the results of our study also showed that female HCWs have a higher risk than males for verbal violence, sexual harassment, and psychological violence [20, 31]. Female HCWs are often in more precarious and lower remuneration and benefits, even when in the same occupational group as men. This occupational vulnerability is heightened by the broader gendered occupational segregation in healthcare [32, 33].

In agreement with previous studies, doctors and nurses showed a higher risk of experiencing violence than OPHERES.5 Furthermore, our results showed a higher risk of psychological violence in the case of activities in contact with both newborns/infants and with the elderly, and verbal violence when dealing with the elderly. Infants are often brought to healthcare facilities by caregivers who may be experiencing high levels of stress or frustration, which can manifest in verbally abusive or intimidating

behavior toward healthcare staff [34]. On the other hand, elderly individuals may experience cognitive decline, dementia, or other mental health issues that can lead to confusion, agitation, or aggression, resulting in verbal outbursts or hostile behavior toward HCWs [35]. As found in previous reports [5], our study identified working the night shift as a risk factor for WPV episodes. The reduced staffing levels during nighttime may lead to increased vulnerability, as fewer colleagues are available to assist in case of confrontations [36].

The results of our analysis showed that HCWs working in psychiatric wards or caring for patients with mental disabilities have a higher risk of experiencing physical, verbal, and psychological violence, in agreement with previous studies [18]. This evidence could be explained by the intrinsic nature of psychiatric disorders, which can lead to unpredictable and sometimes aggressive behavior from patients, increasing the likelihood of confrontational situations [37].

Another context associated in our study with an increased risk of physical, psychological, and sexual violence is occupational health and safety services. A possible explanation is related to the nature of their activity in Italy, which involves assessing fitness for work evaluation. This decision can impact employment status and people's lives, increasing the potential for aggression [38].

Many of the individual and social determinants of violence in healthcare settings, such as mental illness and drug and alcohol abuse, are disproportionally common in correctional and penitentiary facilities [15]. Moreover, the complex and often oppositional nature of the relationship between inmates and correctional staff may place correctional HCWs at high risk of WP [39]. Male healthcare workers in correctional facility settings report higher rates of physical violence compared to female or transgender/gender-expansive counterparts, potentially influenced by traditional gender norms linking masculinity with strength, leading male HCWs to be perceived as targets by aggressive inmates. Societal expectations may also discourage men from reporting incidents, fostering a cycle of under-reporting and increasing their vulnerability to violence [40, 41].

Our findings regarding the prevalence of WPV should be contextualized considering the methodological variability across existing literature. Studies relying exclusively on formal reports, such as compensation claims to INAIL or requests for psychological assistance following assaults, generally report extremely low incidence rates (~0.2–0.3%) due to significant underreporting biases [42,43]. Similarly, hospital-based spontaneous reporting systems, even when explicitly encouraging reports, yield incidence rates ranging from just 1–3% [44,45]. Conversely, studies employing systematic data collection integrated into mandatory health surveillance—as adopted in our research—report notably higher and more consistent prevalence estimates, typically between 5–10% [46,47]. Furthermore, ad-hoc surveys conducted in particularly high-risk hospital departments, such as emergency or triage areas, often report prevalence rates close to 100%, demonstrating that context and data collection methods greatly influence reported violence frequencies [48,49]. Therefore, our relatively high response rate (88.8%) and systematic census method significantly reduced underreporting, likely contributing to our study's comparatively higher prevalence rates.

Some potential limitations of this study need to be mentioned. Despite a clear definition of WPV, underreporting persists in anonymous surveys due to fears of retaliation or being blamed for reporting incidents. Moreover, it was not possible to overcome the bias in reporting violence, as HCWs may be more likely to report serious events and exclude less serious ones.

Our study has some further limitations. Regarding the assessment of gender identity, the WVHS questionnaire was initially structured to assess biological sex, and our addition of the 'Other' category intended to offer only a preliminary and generic representation of gender diversity, potentially oversimplifying its complexity. The absence of a 'prefer not to answer' option may also have influenced participant responses. Additionally, the analysis of sexual harassment incidents may have been influenced by the low number of reported sexual harassment cases, especially among TGE workers. This could have limited the significance of our results, requiring cautious interpretation. Finally, given the TGE subgroup's exploratory nature and small sample size, although statistically significant differences

emerged between TGE and female respondents for certain forms of violence, these findings should be considered preliminary indications rather than definitive evidence. Future research should utilize validated tools specifically designed to capture nuanced gender identities and adopt more sensitive data collection methods to investigate the experiences and vulnerabilities of gender minority HCWs.

However, the study has several strengths. Firstly, the extensive sample size enabled us to analyze the predictor variables of violence within a sizable population. Also, this study highlighted the often-overlooked aspect of the differential experiences of WPV across gender identities by suggesting TGE workers are particularly vulnerable to verbal, psychological, and sexual violence. In this sense, our findings may contribute to the construction of an impact matrix for the assessment of the risk of aggression for HCWs, emphasizing how it would be essential to consider the variable of gender [38].

In conclusion, this study underscores the urgent need for comprehensive interventions to address WPV in healthcare settings, particularly in light of the differential experiences across gender identities. Trans-inclusive non-discrimination policies, gender-sensitive training programs, and enhanced security measures in the most vulnerable healthcare environments should be adopted to address this aim. By prioritizing the safety and well-being of HCWs and addressing the underlying factors that contribute to violence, we can strive to create environments in which all individuals, regardless of gender identity, can thrive and contribute effectively to the delivery of high-quality patient care.

Funding: This research received no external funding.

Institutional Review Board Statement: This study strictly followed the principles of ICH Good Clinical Practice, the Declaration of Helsinki, and national and international ethical guidelines. The research was approved by the Bari University Hospital Ethics Committee (Protocol N. 6663, 2021).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Acknowledgements: The authors thank the Puglia centres of "Sistema Regionale di Gestione Integrata della Sicurezza sul Lavoro (SiRGISL)" for the data extraction.

Declaration of Interest: The authors declare no conflict of interest.

Author Contribution Statement: Project administration and Validation: DS, PL and LV. Supervision and Conceptualization: PL and LV. Methodology, Data curation, and Formal analysis: AS, LDM, GD, GS, GM, GG, VS, RR, and AC. Software: AS. Writing—original draft: AS, LDM, GD, AC, PL and LV. Investigation and Writing—review and editing: AS, LDM, AC, PL and LV. All authors contributed to interpreting results and critically revising the draft. All authors have seen and approved the submitted version.

Declaration on the use of AI: None.

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