

Workplace Violence Against Health Care Providers In Alexandria University Hospitals, Egypt.

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Abstract

Background: Workplace violence (WPV) is a major public health problem worldwide. Although workers in different occupations are at risk of exposure to WPV, health care workers and particularly those working in emergency departments are at increasing risk. Limited research, together with under-estimated magnitude due to underreporting of incidents and the substantial consequences on healthcare delivery, organizations and society in general create an urgent need to target WPV by research. **Objectives:** to determine prevalence, types, perpetrators, consequences and reporting pattern of WPV among physicians and nurses in emergency care units in Alexandria University Hospitals. **Method:** A cross-sectional study was conducted among HCWs to assess WPV in the studied settings. 113 nurses and 81 doctors were interviewed over a three-month period using an adapted form of Workplace Violence in the Health Sector Survey Interviewing Questionnaire. **Results:** prevalence of WPV was 91.7% with psychological abuse being the most common form followed by physical aggression and sexual harassment (87.6%, 49.5% and 12.4% respectively). Patients' relatives were the most common perpetrators of WPV followed by patients themselves. Moreover, most of victims showed symptoms of Post-incident distress such as recalling memories of the incident, avoiding to talk about it and being super-alert. Most of incidents were underreported with physical incidents showing the highest reporting rate (32.3%) compared to incidents of psychological abuse (16.2%), while incidents of sexual harassment were never reported. The most common incriminated factors were ineffective security measures, work overload and overcrowding, improper patient attitudes and shortage of staff and resources. **Conclusions:** WPV is a serious problem in the studied settings and this makes them in urgent need for effective interventions. Reducing incidents of WPV requires integration between multiple sectors rather than relying on a single intervention. The most common recommended measures were application of effective security measures, increasing number of staff and usage of standard protocols and policies against WPV.

Key words: workplace violence, emergency, healthcare workers, Alexandria.

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Introduction

Workplace violence (WPV) is a major public health problem that has received growing attention worldwide.¹ It is defined by the World Health Organization (WHO) as “Incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work,

involving an explicit or implicit challenge to their safety, well-being or health”² WPV is a striking phenomenon that has much increased in the last few years. In fact, it coincides with the escalation of violence in different fields of social life which has been reflected on workers and workplace environment.³ Although most

people perceive the concept of workplace violence as physical aggression, it is not only restricted to the physical type. It can be divided into physical, psychological and sexual violence.⁴

Although all workers in different occupations are at risk of exposure to WPV, health care workers (HCWs) in particular are at increasing risk of WPV compared to other occupations. The WHO reported that between 8% and 38% of health workers suffer physical violence at some point in their careers.⁵ Nationally, a study carried out in Suez Canal University Hospital revealed that 59.7% of HCWs were victims of WPV.⁶ In Alexandria, another study was conducted among nurses in the main university hospital and it revealed that 87.1% of nurses experienced psychological WPV.⁷

Among HCWs in different health care settings, those working in emergency departments are highly exposed to WPV compared to other HCWs. The American College of Emergency Physicians (ACEP) stated that 75% of physicians working in emergency settings were exposed to at least one incident of WPV in the preceding year.⁸ Moreover, in 2011, another survey was conducted among nurses in the United States and this study noted that 54.5% of nurses working in emergency settings had experienced at least one incident of physical or non-physical WPV during the week before conduction of the study.⁹ Patients and their relatives are the most common type of perpetrators of such incidents.¹⁰

There are several adverse events following exposure of HCWs to WPV in health care settings. One of the most common problems HCWs suffer from is post-traumatic stress disorder (PTSD).¹¹ In fact, psychological and emotional consequences are more common and have deeper influence on HCWs than physical injuries.¹² However, consequences of WPV extend beyond the HCWs to affect the quality and process of health care delivery.¹³ Effective management of

incidents of WPV at workplace requires a long-term holistic strategic approach. Raising awareness, training courses and involvement of health care personnel and community gate keepers are key elements in tackling the rising epidemic of WPV together with strict policies and laws and improvement of infrastructure.¹⁴

In Alexandria, few studies have been carried out and research in emergency settings is much scarcer. Therefore, limited research, together with underestimated magnitude due to underreporting of incidents, the well-established substantial consequences on HCWs, healthcare delivery, organizations and society in general and the very huge population served by the emergency units in Alexandria University Hospitals, create an urgent need to target WPV by research. The study aimed to investigate the occurrence of workplace violence (Prevalence, types, perpetrators, consequences and reporting pattern) among physicians and nurses in emergency care units in Alexandria University Hospitals.

Method

A cross-sectional study was conducted among HCWs in the emergency care unit in Alexandria Main University Hospital and in the trauma unit in El Hadara University Hospital to assess WPV in the studied settings. All available HCWs were approached with a response rate of 84.3%. The included participants (113 nurses and 81 doctors) belonged to emergency, surgery and orthopedics departments.

The included participants were interviewed over a three-month period; May to July 2018, using an adapted form of Workplace Violence in the Health Sector Survey Interviewing Questionnaire¹⁵ that was developed through collaborations between WHO, International Labour Office (ILO), International Council of Nurses (ICN) and Public Services International (PCI). It inquired about personal and occupational

Table 1: Socio-demographic characteristics and workplace of the included participants.

Personal data	Nurses (n=113)		Doctors (n=81)		Total (n=194)	
	N	%	N	%	N	%
Age (years)						
20-30	15	13.3	73	90.1	88	45.4
31-40	32	28.3	8	9.9	40	20.6
41-50	48	42.5			48	24.7
51-60	18	15.9			18	9.3
Min-max	25-57					
mean±SD	35.8 ± 9.2 years					
Gender						
Male	10	8.8	68	84.0	78	40.2
Female	103	91.2	13	16.0	116	59.8
Department/unit						
Emergency (ER)	96	85.0	21	26.0	117	60.3
Plastic surgery	0	0	8	10.0	8	4.1
Oncology	0	0	7	8.6	7	3.6
Colorectal	0	0	6	7.4	6	3.1
Head and neck	0	0	6	7.4	6	3.1
Hepatobiliary	0	0	7	8.6	7	3.6
GIT	0	0	6	7.4	6	3.1
Specialities	0	0	7	8.6	7	3.6
Orthopedics	17	15.0	13	16.0	30	15.5

data of HCWs, experiences of different types of WPV, characteristics of workplace environment and opinions of included participants about causes and recommended measures against WPV.

The collected data were revised and coded. Then, data were fed to the computer using Statistical Package for Social Science (SPSS) program (version 22.0). Appropriate descriptive and inferential statistical analyses were done. Prevalence, percentages, arithmetic mean and standard deviation were calculated to describe socio-demographic characteristics of respondents, their occupational characteristics, and assessments of different types of WPV they were exposed to. Chi-square, Fisher's Exact and Monte Carlo tests were performed to compare between categorical variables. A 5% level of significance was selected for this study.

Ethical Consideration

Objectives of the study, the expected benefits, and types of information to be obtained were explained to the health care staff to get their informed consent. The

proposal was submitted to the Research Ethics Committee at the Alexandria Faculty of Medicine and it gained approval. Informed consents (both written and verbal) were obtained from the included participants and privacy and confidentiality of data were ensured.

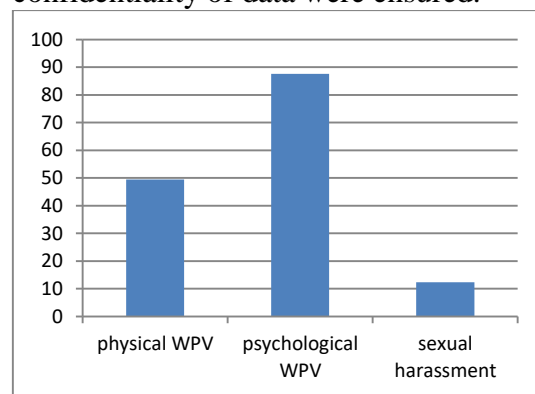


Figure 1: Prevalence of WPV in the studied settings.

Results

The current study included 194 participants. About three fifths (58.25%) of them were nurses and 41.75% were doctors. Age of participants ranged from 25 years to 57 years, with a mean of

Table 2: Characteristics of WPV in the studied settings.

	Physical WPV		Psychological WPV		Sexual harassment	
	N=96	%	N=170	%	N=24	%
Perpetrators						
Patient	27	28.1	68	40.0	13	54.2
Relative	65	67.7	97	57.1	11	45.8
Staff member	2	2.1	4	2.4	0	0
General public	2	2.1	0	0	0	0
Colleague	0	0	1	0.6	0	0
Injury	42	43.8				
Treatment	8	17.0				
Psychological consequences						
Memory recall	52	54.2	63	37.1	18	75.0
Avoidance	63	65.8	64	37.6	24	100
Super-alert	77	80.2	145	85.3	22	91.7
Reporting rate	31	32.3	28	16.2		
Causes of underreporting						
Not important	12	18.5	79	56.4	8	36.4
Ashamed	5	7.7	9	6.4	24	100
Afraid of negative consequences	25	38.5	38	27.1	6	27.3
Useless	60	92.3	107	76.4	18	81.8
Lack of reporting office	3	4.6	25	17.9	1	4.5

χ^2 : Chi-Square Test MC: Mont Carlo test FET: Fisher's Exact Test

Table 3: Opinions of HCWs on factors contributing to physical WPV.

Factors contributing to physical WPV	Nurses N=113		Doctors N=81		Total N=194		Test of significance
	N	%	N	%	N	%	
Patients attitudes	19	16.8	9	11.1	28	14.3	$\chi^2= 1.243$ P=0.265
Work overload	22	19.5	15	18.5	37	19.0	$\chi^2= 0.028$ P=0.868
Overcrowding	12	10.6	5	6.2	17	9.0	$\chi^2= 1.167$ P=0.280
Shortage of staff	9	7.9	19	23.4	28	14.3	$\chi^2= 9.16$ P=0.002*
Ineffective security measures	30	26.7	17	21.1	47	24.0	$\chi^2= 0.795$ P=0.373
Lack of awareness	6	5.3	5	6.2	11	5.7	FET= 0.066 P=1.00
Poor management	5	4.4	4	4.9	9	4.7	FET= 0.028 P=1.00
Shortage of resources	10	8.8	7	8.6	17	9.0	$\chi^2= 0.003$ P=0.960

χ^2 : Chi-Square Test FET: Fisher's Exact Test

*: Statistically significant

35.8±9.2 years, and 45.4% of them were below 30 years old. As for nurses, mean age was 41.3±8.4 years. As for doctors, the mean age was 28.1±1.8 years. More than half of participants (59.8%) were females, while 40.2% were males. Females represented 91.2% of nurses,

while males represented 84% of doctors included.

About two thirds of participants (60.3%) were staff of the emergency department (ER), while 24.2% belonged to surgery departments/units and the remaining 15.5% belonged to Orthopedics department.

Table 4: Opinions of HCWs on factors contributing to psychological WPV.

Factors contributing to psychological WPV	Nurses N=113		Doctors N=81		Total N=194		Test of significance
	N	%	N	%	N	%	
Patients attitudes	23	20.4	10	12.3	33	17.0	$\chi^2= 2.143$ P=0.143
Work overload	18	15.9	12	14.8	30	15.2	$\chi^2= 0.045$ P=0.832
Overcrowding	19	16.9	8	9.8	27	13.8	$\chi^2= 1.895$ P=0.169
Absence of psychological support	13	11.4	9	11.1	22	11.4	$\chi^2= 0.007$ P=0.932
Lack of awareness	12	10.6	7	8.5	19	9.7	$\chi^2= 0.209$ P=0.648
Shortage of resources	5	4.4	7	8.6	12	6.2	$\chi^2= 1.446$ P=0.229
Poor management	4	3.5	5	6.2	9	5.3	FET= 0.739 P=0.495
Ineffective security measures	19	16.9	23	28.8	42	21.4	$\chi^2= 3.73$ P=0.05*

χ^2 : Chi-Square Test

FET: Fisher's Exact Test

*: Statistically significant

All nurses belonged to ER department (85%) and Orthopedics department (15%). As for doctors, 26% belonged to ER department, while 58% of them belonged to surgical departments/units and the remaining doctors (16%) belonged to Orthopedics department (as shown in table 1).

The current study showed that the overall prevalence of WPV in the studied settings was 91.7% (figure 1). The prevalence of physical and psychological WPV among the included participants was 49.5% and 87.6% respectively. As for sexual harassment, it was estimated to be 12.4% and it was significantly higher among nurses compared to doctors ($\chi^2= 7.08$; $p=0.008^*$).

As for perpetrators of incidents of WPV, relatives and patients were the main perpetrators of physical WPV in 67.7% and 28.1% of incidents respectively. Regarding incidents of psychological violence, relatives were the main perpetrators in 57.1% of incidents while patients themselves were the perpetrators in 40% of incidents. As for sexual harassment, patients and their relatives

were the main perpetrators (54.2% and 45.8% respectively (as demonstrated in table 2).

Regarding impact of WPV on included participants, the current study showed that 43.8% of participants got injured because of the attack, and 17% of those who got injured required official treatment. As for psychological consequences, nearly half of the victims (54.2%) could recall memories of WPV attacks. Nearly two thirds (65.6%) of victims tended to avoid mentioning or talking about the attack. Moreover, 80.2% of victims became super alert in workplace as a response to the attack. Regarding psychological WPV, more than one third of participants(37.1%) suffered from recalling of memories. Moreover, another one third (37.6%) tended to avoid talking about the incidents. Besides, 85.3% of victims reported being over suspicious (super alert) while being in contact with patients and accompanying relatives to avoid further experience of future incidents. As for sexual harassment, three quarters of victims tended to recall memories of the incident,

Table 5: Difference between doctors and nurses as regard characteristics of exposure to physical WPV.

Characteristics of incidents of physical WPV	Nurses (n=60)		Doctors (n=36)		Total (n=96)		Test of significance
	N	%	N	%	N	%	
Perpetrators							
Patient	16	26.7	11	30.6	27	28.1	MC= 2.547
Relative	40	66.7	25	69.4	65	67.7	P=0.516
Staff member	2	3.3			2	2.1	
General public	2	3.3			2	2.1	
Injury	25	41.7	17	47.2	42	43.8	$\chi^2= 0.282$ P=0.595
Treatment	4	14.8	4	20.0	8	17.0	FET= 0.219 P=0.707
Memories							
Yes	31	51.7	21	58.3	52	54.2	$\chi^2= 0.403$
No	29	48.3	15	41.7	44	45.8	P=0.526
Avoidance							
Yes	40	66.7	23	63.9	63	65.6	$\chi^2= 0.077$
No	20	33.3	13	36.1	33	34.4	P=0.781
Being super alert							
Yes	46	76.7	31	86.1	77	80.2	$\chi^2= 1.264$
No	14	23.3	5	13.9	19	19.8	P=0.261
Causes of underreporting							
Not important	8	21.1	4	14.8	12	18.5	FET= 0.408 P=0.747
Ashamed	2	5.3	3	11.1	5	7.7	FET= 0.760 P=0.642
Afraid of negative consequences	15	39.5	10	37	25	38.5	$\chi^2= 0.04$ P=0.842
Useless	36	94.7	24	88.9	60	92.3	FET= 0.760 P=0.642
Did not know who to report to	2	5.3	1	3.7	3	4.6	FET= 0.087 P=1.00

χ^2 : Chi-Square Test

MC: Mont Carlo test

FET: Fisher's Exact Test

while 91.7% became over-suspicious. Moreover, all victims tended to avoid talking about the incident.

Regarding reporting pattern for incidents of WPV, the majority of incidents were not reported. Only 32.3% of incidents of physical WPV were reported, compared to 16.2% of incidents of psychological violence, while incidents of sexual harassment were never reported. Causes of underreporting were variable. As for physical WPV, Most of participants felt it is useless to report the incident (92.3%). Some of the participants were afraid of negative consequences (38.5%).

Moreover, 18.5% of victims ignored the incident and believed it is not important to report it. Less than one tenth (7.7%) of victims felt ashamed to report, and 4.6% did not know who to report to. As for psychological violence, 76.4% of victims believed it was useless to report such incidents. Moreover, 56.4% of incidents were ignored and perceived as not important. Besides, nearly one quarter of participants (27.1%) did not report as they were afraid of negative consequences. In the remaining incidents, the victims either did not know who to report the incident to (17.9%) or felt ashamed to report (6.4%). None of incidents of sexual harassment

Table 6: Difference between doctors and nurses as regard characteristics of exposure to psychological WPV.

Characteristics of incidents of psychological WPV	Nurses N=101		Doctors N=69		Total N=170		Test of significance
	N	%	N	%	N	%	
The perpetrator							
Patient	41	40.6	27	39.1	68	40	MC= 1.222
Relative	56	55.4	41	59.4	97	57.1	P=0.849
Staff member	3	3	1	1.4	4	2.4	
Colleague	1	1	0	0	1	0.6	
Memory recall							
Yes	38	37.6	25	36.2	63	37.1	$\chi^2= 0.043$
No	63	62.4	44	63.8	107	62.9	P=0.854
Avoidance							
Yes	38	37.6	26	37.7	64	37.6	$\chi^2= 0$
No	63	62.4	43	62.3	106	62.4	P=0.994
Super alert							
Yes	84	83.2	61	88.4	145	85.3	$\chi^2= 0.897$
No	17	16.8	8	11.6	25	14.7	P=0.344
Causes of underreporting							
Not important	47	56	32	57.1	79	56.4	$\chi^2= 0.019$ P=0.889
Ashamed	5	6	4	7.1	9	6.4	FET= 0.079 P=1.00
Afraid of negative consequences	20	23.8	18	32.1	38	27.1	$\chi^2= 1.18$ P=0.277
Useless	63	75	44	78.6	107	76.4	$\chi^2= 0.238$ P=0.626
Did not know who to report to	14	16.7	11	19.6	25	17.9	$\chi^2= 0.203$ P=652

was reported as all victims were ashamed to report such incidents, while 81.8% of them felt it was useless to report. Regarding causes of physical WPV from the perspective of included participants, table 3 demonstrated that 24% of them thought that lack of effective security measures is the main factor contributing to physical WPV. Work overload was the main trigger in the perspective of 19% of participants. More than one tenth (14.3%) accused patients themselves for their bad morals and behaviours as a cause of violence. Moreover, another factor was shortage of staff working in the studied settings (14.3%) with 23.4% of doctors considered it as a major trigger for WPV compared to 7.9% of nurses and this difference was statistically significant ($p=0.002^*$).

As for triggers for psychological violence, table 4 showed that 21.43% of included participants reported that lack of effective security measures was a major trigger. Moreover, bad attitudes by patients, workload and overcrowding were identified as main contributing factors for psychological violence (17%, 15.2% and 13.8% respectively). Ineffective security measures, as a contributing factor to psychological WPV, was significantly more reported by doctors compared to nurses ($p=0.05$). Tables 5 and 6 demonstrated that no statistically significant differences were observed between doctors and nurses in the studied settings as regard characteristics of WPV (perpetrators, psychological consequences and reporting pattern).

Table 7: Proposed solutions to reduce incidents of WPV against HCWs.

Proposed solutions to reduce WPV	Nurses N=113		Doctors N=81		Total N=194		Test of significance
	N	%	N	%	N	%	
Standard protocols and policies against WPV	15	13.2	11	13.6	26	13.8	$\chi^2= 0.004$ P=0.591
Increasing staff	30	26.5	24	29.6	54	27.6	$\chi^2= 0.223$ P=0.637
Effective security measures	45	39.9	22	27.2	67	34.5	$\chi^2= 3.346$ P=0.067
Raising awareness	13	11.5	7	8.6	20	10.4	$\chi^2= 0.418$ P=0.518
Improving environment	7	6.2	6	7.4	13	6.9	$\chi^2= 0.111$ P=0.739
Available resources	2	1.8	5	6.1	7	3.4	FET= 2.63 P=0.131
Restriction of relatives	1	0.9	6	7.4	7	3.4	FET= 5.771 P=0.022*

χ^2 : Chi-Square Test

FET: Fisher's Exact Test

*: Statistically significant

Table 7 demonstrated the proposed solutions to reduce WPV against health care providers. Nearly a third (34.5%) of participants declared the urgent need for effective security measures. Increasing number of HCWs was another proposed measure by 27.6% of participants. Besides, the need for establishment of standard protocols and policies against violence was reported by 13.8% of included participants. Moreover, 3.4% highlighted the importance of restricted entrance of patient relatives and it was significantly more proposed by doctors compared to nurses as an effective solution to reduce WPV (p= 0.022*).

Discussion:

The current study estimated that the overall prevalence of WPV was 91.7%. Psychological violence was the most common form of WPV followed by physical aggression and sexual harassment (87.6%, 49.5% and 12.4% respectively). These results were higher than the estimated prevalence by the American College of Emergency Physicians in 2018 (nearly half).¹⁶ Another estimated result was obtained from a recent study conducted in Hubei, China in 2018 (62.2%) including 18.9% and 61.4% for physical and psychological

WPV respectively.¹⁷ These differences could be explained by the nature of Egyptian community who tends to show escalating levels of violence and less respect to HCWs. Absence of strict laws and penalties against perpetrators encourage others to commit aggressive behaviours. Another factor is that the studied settings represent two of the largest emergency departments in Egypt, serving populations of at least four governorates and suffering from work overload and shortage of staff and resources.

In general, patients' relatives or companions were the main perpetrators of WPV as they were responsible for 67.7%, 57.1% and 45.8% of incidents of physical, psychological and sexual WPV respectively, followed by patients themselves who were involved in 28.1%, 40% and 54.2% of those incidents respectively. Patients were accused to be responsible for WPV by a Swiss Study conducted in 2018 (93%).¹⁸ On the other hand, relatives were the main perpetrators according to a Jordanian study conducted in underserved areas in 2013 (73.9% for physical aggression).¹⁹ The justification for this difference is that families in remote and underserved areas in Jordan

where they tend to accompany their ill members in large numbers and could be easily triggered if the medical condition of their loved family members goes worse or if the medical care is not satisfactory.

As for psychological consequences of WPV on victims, most of them showed symptoms of Post-incident distress such as memory recall, avoidance to speak about the incident and being super-alert (54.2%, 65.6% and 80.2% following physical aggression, 37.1%, 37.6% and 85.3% following psychological abuse and 75%, 100% and 91.7% following sexual harassment respectively). These results were in harmony with the findings reported by Rosenthal LJ et al in 2018 who reported that following incidents of WPV, 79.7% of victims endorsed post-traumatic symptoms.²⁰ Other consequences, as observed by Schablon et al, included annoyance, fear, self-doubt, helplessness, sadness and loss of confidence.²¹

Generally, the current study showed no statistical significant difference between doctors and nurses regarding exposure to physical and psychological violence and patterns of exposure. The nature and characteristics of workplace environment in the studied settings made HCWs possess similar risk of being exposed to WPV regardless of their professional role in the studied settings.

As for sexual harassment, prevalence among nurses was significantly higher than among doctors (17.7% and 4.9% respectively). These results could be justified by the fact that most of nurses were females (91.2%) compared to doctors who were mostly males (84%). Another factor was that nurses had more frequent contact with patients and their relatives compared to doctors, and this made them more at risk to be sexually harassed by them.

Regarding reporting pattern of WPV, most of incidents were not reported. Physical incidents showed the highest reporting rate (32.3%), compared to

incidents of psychological violence (16.2%), while incidents of sexual harassment were never reported. The main causes of underreporting were feeling it was useless to report, fear of bad consequences, tending to neglect the incident and feeling ashamed to report especially in case of sexual harassment. Almost similar results were observed by Abdellah et al in 2017 through a study conducted in emergency department in Ismailia, Egypt (23.8% and 29.5% for physical and psychological WPV respectively).⁶ On the other hand, a much higher reporting pattern was observed by Schablon et al in 2018 (85%).²¹ The variations in reporting patterns could be explained by supportive social and workplace environment, encouragement for reporting and presence of strict laws and penalties.

Regarding factors contributing to occurrence of WPV, the most common identified triggers were ineffective security measures, work overload and overcrowding, improper patients' attitudes and shortage of staff and resources. These findings were in agreement with the factors observed by Abu Alrub et al. (2014)¹⁹ and Ambesh (2016)²² who categorized them into administrative factors, such as absence of effective policies and improper handling of incidents, staff factors such as shortage and poor communication skills, patients factors such as tension and previous impression of poor quality care, societal factors such as increasing levels of violence and negative image of HCWs, and security factors such as unqualified security members and increased public access.

The main solutions proposed by HCWs to tackle WPV were application of effective security measures (34.5%), increasing staff members (27.6%) and usage of standard protocols and policies to deal with incidents of WPV (13.8%). In accordance with these findings, Abu Alrub et al. (2014)¹⁹ proposed almost

similar solutions to reduce incidents of WPV. There is no specific measure that can be relied upon lonely to tackle the rising magnitude of WPV. However, a holistic inter-disciplinary approach is required to effectively reduce these incidents.²³

Conclusion

HCWs in the studied settings were exposed to considerable amounts of violence in workplace. Psychological WPV was the most common type of violence experienced by the included participants, followed by physical aggression. Relatives/companions of patients were the main perpetrators of incidents of WPV followed by patients themselves. Symptoms of Post-incident distress were obvious among the included participants following exposure to WPV. Incidents of WPV showed obvious underreporting in the studied settings. Measures against WPV require a more holistic approach rather than relying only on a specific intervention. Raising awareness, training courses and involvement of health care personnel and community gate keepers are key elements in tackling the rising epidemic of WPV together with strict policies and laws and improvement of infrastructure.

Conflicts of interests: None declared.

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