

ORIGINAL ARTICLE

Workplace violence against healthcare workers in Emergency Departments. A case-control study

Gabriele d'Ettorre¹, Vincenza Pellicani², Annamaria Vullo³

¹UO Servizio Prevenzione e Protezione - Medicina del lavoro, ASL Brindisi, Brindisi, Italy; ²Department of Mental Health, ASL Lecce, Lecce, Italy; ³Department of Anatomical, Histological, Forensic and Orthopaedic Sciences, Sapienza University of Rome, Rome, Italy

Summary. *Background and aim:* Assessment and management of workplace violence (WPV) towards healthcare workers (HCWs) employed in Emergency Departments (EDs) represents a challenge for healthcare organizations worldwide. To date there is a lack of scientific data about the impact of work-shifts on the occurrence of WPV against ED HCWs. The purpose of this study was to investigate the relationship between work shift schedules and WPV against registered nurses (RNs) working on non-traditional shifts, including nights and 12-hour shifts. *Methods:* The authors conducted a cross-sectional nested case-control analysis of data regarding the episodes of WPV perpetrated by patients or their relatives against RNs employed in three EDs, in the period between January–December 2017. *Results:* The one-year incidence of WPV was 29,30 per 100 Full Time Equivalent (FTE) positions. Cumulative nightshifts were significant for 3 or more nightshifts compared to working less than 3 nightshifts during the 7 days before the episodes of WPV; additionally, RNs working 9 or more night-shifts showed higher risk of experiencing WPV compared to RNs working less than 4 night-shifts in the previous 28 days. *Conclusion:* In the present study shift work and WPV occurrence against ED RNs resulted interconnected; improvement interventions aimed at preventing the WPV should consider the characteristics of work shift schedules with the purposes of: 1) limiting the night shifts up to two per week and up eight per month; 2) adopting constant forward-rotating shift schedules. (www.actabiomedica.it)

Key words: assault, risk assessment, risk management, nurse, shift work

Introduction

Globally, healthcare organizations face the concern of workplace violence (WPV) perpetrated by patients against healthcare workers (HCWs) employed in Emergency Departments (EDs). In fact, by literature, between 24% and 88,8% of ED HCWs have been victim of violence by a patient in a 12-month period (1-3); this large range of occurrence is due to: 1) non-unique definition of workplace violence adopted by the authors in their studies (i.e. some studies analyzed only physical assaults and not considered verbal violence or sexual harassment); 2) phenomenon of under-reporting of WPV by the victims, due to many factors (i.e. fear of retaliation from aggressor and

his/her family, feelings of shame related to being the subject of aggression, or addiction to WPV considered an integral part of job) (4). In many studies the predictors of violence perpetrated by patients against HCWs turned out to be linked with patients' diseases: dementia, schizophrenia, anxiety, acute stress reaction, suicidal ideation, and alcohol and drug intoxication are frequently related to WPV (5, 6). A growing literature evidenced the role of issues within the EDs in causing the occurrence of WPV. Particularly, inadequate HCW-patient relationship, high anxiety level among the staff, poorer perceived safety climates, high job demands, have been demonstrated as strongly and positively associated to WPV occurrence (7, 8). In a recent study Wu et al. (9) showed the relationship between

high job demand and WPV; in fact, an heavy workload and consequent high-job stress level among HCWs, showed being the cause of poor-quality medical care which was straightly linked to WPV perpetrated by dissatisfied patients towards HCWs.

Many studies emphasized also the relationship between occupational injuries among HCWs and workplace organizational factors related to work-shift schedules (i.e. work-shift duration, nightshift-work) (10, 11); among hospital registered nurses (RNs), Hopcia K. et al. (10) demonstrated that long working hours were related to injuries occurrence (not including WPV) and suggested the need of workplace policy targeted on work-shifts as a special concern in order to improve the safety and health of HCWs. Although these evidences, to date there is a lack of scientific data about the impact of work-shifts, including nightshifts, on the occurrence of WPV against ED HCWs.

The purpose of this study was to investigate the relationship between work shift schedules and WPV among RNs working on non-traditional shifts, including nights and 12-hour shifts.

Methods

The authors conducted a cross-sectional nested case-control analysis of data regarding the episodes of WPV perpetrated by patients or their relatives against RNs employed in three first-level EDs in Salento, south east of Italy, and staffing data for the same RNs in the period between January and December 2017; the aims of the study were to evaluate: 1) the relationship between consecutive workdays, nightshifts, cumulative hours and WPV towards RNs 2) the relationship between forward-rotating shift schedules (morning-afternoon-night) and WPV occurrence. For the aims of the present study, the authors analyzed the work shift prior to the date of each episode of WPV; in particular, consecutive workdays and cumulative hours worked in the previous 7 and 28 days, number of cumulative nights worked in the previous 7 and 28 days, direction of rotating shift schedules during the 28 days prior to the date of WPV, were detected. Nightshift was defined as a shift which included 1:00 am and 2:00 am as part of the shift. The analysis concerned 741 RNs (including 203 men); the mean age was 45,4 years (SD

2,9), mean length of service 23,8 years (SD 2, 5). The average volume of contacts for each ED was 42,000 patients per year. Cases were defined as the RNs who suffered a WPV from patients or their relatives during the 2017 year. If the assaulted RN reported more than one episode of WPV, all the WPV episodes were included in the study. Each case was matched with one RN employed in the same hospital, with similar demographic characteristic (unit type, job type, gender, age +/- 10 years). For this research the author examined the Occupational Prevention and Protection Service database based in the hospital and consisting of all incident reports and human resources informations. In this study, WPV perpetrated by patients or their relatives against HCWs was defined: "Any incident in which a person is abused, threatened or assaulted in circumstances relating to their work. This can include verbal abuse or threats as well as physical attacks" (12).

The statistical analysis included a logistic regression analysis to calculate the incidence and odds ratio (OR) with 95% confidence interval. All analyses were performed using SPSS software for Windows.

Forward-rotating shift was defined as a shift rotation in clockwise direction (begins during day, moves to evening and then to night); shift rotations were defined as backward-rotations if in counterclockwise direction: from day to night to evening shifts.

The study was performed as part of the obligatory evaluation of workplace violence, required by Italian Legislative Decree 81/08, and needed no formal approval by the local ethics committee.

Results

The study showed that in the analyzed period occurred 186 episodes of WPV; the one-year incidence of WPV was 29,30 per 100 Full Time Equivalent (FTE) positions. Twenty-one injured RNs reported more than one episode of WPV. No significant differences were found among cases and controls compared by cumulative hours and consecutive workdays worked in the 7 and 28 days prior to WPV occurrence. Cumulative nightshifts were significant for 3 or more nightshifts compared to working less than 3 nightshifts during the previous 7 days; additionally, RNs working 9 or more night-shifts showed higher risk of experiencing

WPV compared to RNs working less than 4 night-shifts in the previous 28 days (Table 1). WPV episodes occurred less frequently among HCWs adopting constant forward-rotating shift schedules compared to different shift schedules (i.e. back-rotating shift schedules or non constant forward-rotating shift schedules) during the last 28 days (OR=0,57; 95% CI= 0,35-0,91 $p<0,05$).

Discussion

The findings of the present study revealed the relationship between night-shift work and the occurrence of WPV against ED RNs; consequently, a strategic way in order to approach the issue of WPV should consider the impact of night shifts worked by RNs, with the aim to minimize the occurrence of WPV perpetrated by patients and their relatives towards RNs. In addition to the findings of many studies which demonstrated the link between shiftwork and conse-

quent negative effects for both workers and healthcare enterprises (i.e. occupational stress, burnout, fatigue, sleeping difficulties, reduced work efficiency, poor performance, decreased job satisfaction, increased rates of absenteeism and turnover and increased accident and injury rates) (13-14), the present study showed the detrimental impact of frequent night shift work on ED HCWs security with regard to WPV occurrence, susceptible to be minimized through organizational interventions aimed at reducing the number of night shifts per RN up 2 nights a week and up 8 nights every 28 days. The analysis also showed that forward-rotating shift-work (shift rotation in the clockwise direction) was a protective shift schedule in regard to minimizing WPV occurrence when compared to shift schedules non systematically forward-rotating. This finding is consistent with literature (15), which revealed the systematic adoption of forward-rotating schedule as a strategic organizational way to better protect HCWs from occupational hazards rather than a backward-ro-

Table 1. Odds Ratios for number of night-shifts worked 7 and 28 days prior to the day of workplace violence (WPV) episodes

Number of night-shifts in previous 7 days (length ≥ 4 hours)	WPV cases N. 186 (%)	Controls N. 186 (%)	O.R. (95% CI)	P-value
0	7 (3,88)	12 (8,74)	1*	
1-2	88 (49,52)	123 (66,02)	1,23 (0,46-3,24)	>0,05
3-6	91 (46,60)	51 (25,24)	3,06 (1,13-8,26)	<0,05
Number of night-shifts in previous 28 days (length ≥ 4 hours)				
	NSSI cases N. 186 (%)	Controls N. 186 (%)	O.R. (95% CI)	P-value
< 4	49 (26,21)	64 (33,98)	1*	
4-8	49 (28,16)	73 (39,81)	0,88 (0,52-1,47)	>0,05
>8	88 (45,63)	49 (26,21)	2,35 (1,41-3,91)	<0,05

CI, confidence interval. *Referent category

tating schedule (shift rotation in the counterclockwise direction), or other rotating schedules.

Conclusion

In the present study the occurrence of WPV towards ED RNs appeared linked with shift-work schedules, including nightshifts. Healthcare managers should consider the need of organizational interventions aimed at adopting forward-rotating shift-work schedules and at avoiding nightshifts more than twice a week or eight monthly, with the aim to minimize the occurrence of WPV in EDs.

The present study suffers from some limitations: the shortness of the analyzed period and the smallness of the analyzed sample do not allow us to draw strong conclusions about the relationship between shift work schedules and occurrence of WPV. Although these limitations the analysis shows statistically significant increases in ORs for WPV among EDs HCWs working shift work schedules.

Highlights

- 1) In the present study the occurrence of WPV towards ED RNs appears linked with shift-work schedules, including nightshifts.
- 2) Organisational interventions are needed to better protect ED RNs from WPV
- 3) Healthcare managers should consider the need of organisational interventions aimed at adopting forward-rotating shift-work schedules and at avoiding nightshifts more than twice a week or eight monthly.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

References

1. Kowalenko T, Gates D, Gillespie GL, Succop P, Mentzel TK. Prospective study of violence against ED workers. *Am J Emerg Med* 2013; 31: 197-205.
2. Guglielmetti C, Gilardi S, Licata M, De Luca G. The healthcare operators' experience with aggressive patients and their visitors: a cross-sectional study in four clinical departments. *Med Lav* 2016; 107: 223-234.
3. d'Ettorre G, Pellicani V, Mazzotta M, Vullo AM. Preventing and managing workplace violence against healthcare workers in Emergency Departments. *Acta Biomed for Health Professions* 2018; 89, S. 4: 28-36 doi.org/10.23750/abm.v89i4-S.7113
4. Ferri P, Silvestri M, Artoni C, Di Lorenzo R. Workplace violence in different settings and among various health professionals in an Italian general hospital: a cross-sectional study. *Psychology Research and Behavior Management* 2016; 9: 263-75.
5. Gillespie GL, Bresler S, Gates DM, Succop P. Posttraumatic stress symptomatology among emergency department workers following workplace aggression. *Workplace Health Saf* 2013; 61: 247-54.
6. Spector PE, Zhou ZE, Che XX. Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: a quantitative review. *Int J Nurs Stud* 2014; 51: 72-84.
7. Shaw J. Staff perceptions of workplace violence in a pediatric emergency department. *Work* 2015; 51: 39-49.
8. Angland S, Dowling M, Casey D. Nurses' perceptions of the factors which cause violence and aggression in the emergency department: a qualitative study. *Int Emerg Nurs* 2014; 22: 134-9.
9. Wu JC, Tung TH, Chen PY, Chen YL, Lin YW, Chen FL. Determinants of workplace violence against clinical physicians in hospitals. *J Occup Health* 2015; 57: 540-7.
10. Hopcia K, Dennerlein JT, Hashimoto D, Orechia T, Sorensen G. A Case-Control Study of Occupational Injuries for Consecutive and Cumulative Shifts Among Hospital Registered Nurses and Patient Care Associates. *Workplace Health Saf* 2012; 60(10): 437-444.
11. d'Ettorre G; Needlestick and Sharp Injuries Among Registered Nurses: A Case-Control Study. *Ann Work Expo Health* 2017; 61 (5): 596-599. doi: 10.1093/annweh/wxx027
12. Health and Safety Executive (UK) [Internet]. Work-related violence. 2016. Available from: <http://www.hse.gov.uk/violence/index.htm>. Accessed December 28, 2016.
13. Weaver MD, Patterson PD, Fabio A, Moore CG, Freiberg MS, Songer TJ. The association between weekly work hours, crew familiarity, and occupational injury and illness in emergency medical services workers. *Am J Ind Med* 2015; 58(12): 1270-7.
14. Wicker S, Stirn AV, Rabenau HF, von Gierke L, Wutzler S, Stephan C. Needlestick injuries: causes, preventability and psychological impact. *Infection* 2014; 42(3): 549-52.
15. Health and Safety Executive (UK). Managing shiftwork - Health and safety guidance. London: HSE. 2006. Available from: www.hse.gov.uk/pubns/books/hsg256 Accessed May 2, 2018

Received: 9 May 2018

Accepted: 13 July 2018

Correspondence:

Gabriele d'Ettorre

Direttore UO Servizio Prevenzione e Protezione
Medicina del lavoro, ASL Brindisi

E-mail: gabriele.det@libero.it