

Preliminary risk assessment of workplace violence in hospital emergency departments

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Key words: Risk assessment, aggression, validation, questionnaire, type II violence

Parole chiave: Valutazione del rischio, aggressione, validazione, questionario, violenza di tipo II

Abstract

Background. *The risk assessment of workplace violence in emergency departments represents a global challenge for both healthcare organizations and workers. Recent studies have revealed increased rates of workplace violence towards physicians and nurses employed in emergency departments and have shown that type II is the most common typology of workplace violence among the four types of workplace violence defined by the National Institute for Occupational Safety and Health. The present study aimed to develop a methodological technique for a preliminary assessment of type II workplace violence risk in emergency departments.*

Methods. *The Delphi method was used to develop a questionnaire entitled Emergency Department Workplace Violence-Questionnaire which was composed of two sections: 1) sentinel events, and 2) risk factors. The authors used the Emergency Department Workplace Violence-Questionnaire to evaluate the workplace violence risk among physicians and nurses employed in a hospital emergency department.*

Results. *The Emergency Department Workplace Violence-Questionnaire was composed of 21 items. The sentinel events section consisted of three company indicators related to workplace violence and identified three areas of risk. The risk factors section identified 18 organizational and environmental factors associated with workplace violence occurrence. The assessment of workplace violence risk in the targeted hospital emergency departments, obtained through the use of the Emergency Department Workplace Violence-Questionnaire, showed a medium risk of workplace violence for both physicians (score=18) and nurses (score=19.5); the analysis found objective risk factors associated with workplace violence and led us to suggest organizational and environmental interventions for reducing the sources of risk among healthcare workers and to prioritize the interventions targeted at the problematical issues detected by the Emergency Department Workplace Violence-Questionnaire. The corrective interventions were focused on an engineering level (i.e. absence of areas for patients/clients to de-escalate, absence of alarm systems) and regarding the organizational environment (i.e. absence of a Workplace Violence Task Force to assess workplace violence risk and develop solutions, working alone).*

Conclusions. *The proposed questionnaire proved to be a valid, structured, and reliable tool for assessing the risk of workplace violence in the targeted emergency departments and allowed for the identification of improvement actions targeted at specific critical issues which could be minimized through strategic interventions.*

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Introduction

The prevention of workplace violence (WPV) against emergency department (ED) healthcare workers (HCWs) has become an increasingly important global concern for both healthcare organizations and HCWs (1-5). According to the National Institute for Occupational Safety and Health (NIOSH), workplace violence is defined as “violent acts, including physical assaults and threats of assault, directed toward persons at work or on duty” (6). Violence is further defined by typology: type I) *criminal Intent*, where the perpetrator does not have any reason to be in the place of business other than committing a crime, such as a robbery; type II) customer/client, where the perpetrator of the violence is receiving a service from the victim; type III) *worker-on-worker*, where the perpetrator is a current or previous employee of the business, and type IV) *intimate partner violence*, where a worker’s intimate partner perpetrates an act of violence in the workplace (7–9). Customer/client violence (type II WPV) is the most common type of violence reported in the healthcare industry, and ED HCWs have been recognized as being exposed to a higher prevalence of type II WPV compared to other HCWs. Patient assault has been identified as the primary cause of violence-related injury suffered by ED HCWs (10-12). Dementia, schizophrenia, anxiety, acute stress reaction, suicidal ideation, and alcohol and drug intoxication have been found to be predictors of physical violence perpetrated by patients against HCWs. On the contrary, verbal violence is frequently perpetrated by patients in a lucid and normal state of consciousness (13-17). Organizational factors within EDs have been identified as frequent determinants of WPV, in particular, staff interaction variables (high interpersonal conflict, low efficiency, lack of team work), high work-related stress, and poor safety climate (18-22). In a recent study, Wu et al. (23) demonstrated the

relationship between high job demand and type II WPV. Indeed, an excessive service volume, high-stress situations, and an overload of physicians in daily practice were related to perceived poor-quality medical care and, consequently, to dissatisfied patients, which was the main cause of WPV against physicians. With regard to the setting where WPV takes place, a cross-sectional study by Ferri et al. (24) showed that in an Italian ED 63% of violent events occurred in the waiting room, leading to the hypothesis that there is a relationship between WPV and a high level of anxiety and stress endured by both patients and their caretakers or relatives which is compounded by long waits. A survey of literature showed that to date no assessment questionnaire exists to evaluate the risk of type II WPV in EDs. For this reason, the present study aimed to develop a methodological technique for a preliminary objective assessment, at both organizational and environmental levels, of type II WPV risk in hospital EDs using an empirical method.

Methods

In this study the definition of WPV corresponded to Type II WPV, according to the NIOSH definition (6). It was defined as WPV perpetrated by patients or their relatives against HCWs employed in hospital EDs. In literature, the occupational risk assessment of WPV in regards to physical work environment and organizational work environment focuses mainly on both the predictors and the determinants of WPV within the EDs (18-23, 25-28). In particular, it has been evidenced that the interrelation between physical work environment and organizational setting is significant in terms of predicting violence (29). The authors empirically adapted this approach to develop an objective risk assessment of the type II WPV in hospital EDs, based on the analysis

of objective predictors and determinants of WPV within the EDs. Therefore, this study was based on the objective evaluation of occupational data regarding physical work environment and organizational environment, which previous literature had associated with WPV. This study did not include factors associated with the perpetrators of WPV or the workers' perception of risk factors associated with WPV (i. e. safety climate). The aims of the proposed methodological path were: 1) to detect, preliminarily and objectively, the occupational risk profile for homogeneous groups exposed to WPV risk; and 2) to detect the consequent interventions effective in minimizing such risk. In phase I of this study, the authors designed the Emergency Department Workplace Violence Questionnaire (ED WPV-Q) with the aim of calculating, at organizational and environmental level, the objective WPV Risk (WPV-R) index, empirically defined as the product of the interaction between sentinel events (SE) and risk factors (RF) associated with WPV ($WPV-R = SE \times RF$); ED WPV-Q was designed after a review of literature to collect recent evidence related to both sentinel events (SE) and risk factors (RF) of WPV at organizational and environmental level, within the hospital EDs. The environmental level included the physical design of the ED, such as comfort, microclimate, lighting, and security alarms. The organizational level factors included issues related to working alone, workers' training on WPV, company WPV prevention policy and information to waiting patients.

The ED WPV-Q was based on: 1) the "Occupational Safety and Health Administration (OSHA – U.S. Department of Labor) Enforcement Procedures and Scheduling for Occupational Exposure to Workplace Violence" (30), which provides guidance and procedures to be followed when conducting inspections and issuing citations related to the occupational exposure to WPV; 2) literature review on the

assessment and management of WPV in EDs. The questionnaire was addressed to homogeneous groups of HCWs exposed to WPV and did not analyze the individual characteristics of workers and perpetrators of WPV. In order to obtain consensus on the ED WPV-Q, the Delphi method was used. The Delphi method involves an iterative process of review by a panel of experts that is designed to achieve consensus regarding the final list of checklist steps/metrics (31). In phase II of this study, for the validation of ED WPV-Q, a panel of eligible experts was selected in Italy; the experts were identified based on specific criteria, including having active involvement in occupational risk assessment, being trainers on safety and health at work, having produced prior publications in the field of WPV. Each expert was asked to rate the steps on a Likert scale from 1 "not important" to 5 "essential"; means and 95 % confidence intervals (CIs) were calculated for each step to identify relevant steps. The 95 % CIs were used to quantify the variability of the experts' responses. Rated on a Likert scale 1–5, the CIs were between 1.00 and 5.00. An item was accepted as a key item if the lower confidence limit was ≥ 3.00 . A step was excluded if the upper confidence limit was ≤ 3.50 . In Delphi round 2, a cut off point for consensus was predetermined. Consensus was established when at least 80 % of the respondents rated the step as ≥ 3 . This step was then accepted as a key step. If the 80 % threshold was not reached, the step was excluded. A Cronbach's alpha was used as a measure of consistency among the opinions of the experts, and a value of ≥ 0.80 was chosen as a cut-off value for determining consensus. In phase III of the present study, the questionnaire validated by the panelists was used in a pilot study, performed in the period between May and June 2018, to assess the WPV risk in an hospital ED, in Salento (Italy); the questionnaire was administered to the head physician of such Department, with the aim to assess the feasibility of ED

WPV-Q. The study was performed as part of the obligatory evaluation of occupational risks, which is required by Italian Legislative Decree 81/08 (32). The present study required no formal approval by the local ethics committee.

Statistical analysis

Data were analyzed with the SPSS software package (Statistical Package for Social Sciences), version 14.0. Comparisons between groups were performed with the Mann-Whitney U test for nonparametric data in the case of two independent groups. The statistical significance was set at $p < 0.05$ for all analyses.

Results

Twelve experts were invited to participate. Of these, 10 (83.3%) agreed and completed the first and second round (5 occupational physicians, 2 clinical psychologists, 2 occupational safety professionals, 1 forensic physician). Cronbach's alpha was calculated as 0.90 and showed high internal consistency among the respondents for the items included in the final questionnaire. The results are presented in Tables 1-3. The Delphi round one had 23 items to be rated, of which 21 items reached consensus (Table 1). The remaining two items were reassessed in round two and were excluded because they did not reach consensus (Table 2). The final ED WPV-Q was composed of 21 items (Table 3). The SE section identified three company indicators related to WPV and three risk levels: low (a score of 0 to 2), medium (a score of 3 or 4), and high (a score of 5 or 6). Low, medium, and high risk scores were converted respectively to 0, 1.5, and 2. The RF section identified 18 organizational and environmental factors associated with WPV occurrence.

The questionnaire identified three levels of WPV risk: low (a score < 12), medium

(a score >12 and ≤ 24), and high (a score >24).

The assessment of WPV risk in the targeted hospital ED, obtained by an objective approach and utilizing the ED WPV-Q, showed a medium level of WPV risk for both physicians (score=18) and nurses (score=19.5); these differences were not statistically significant ($p>0.05$). In particular, among physicians the SE section evidenced a medium risk (a score of 3, converted to 1.5) and the RF section showed a score of 12. Among nurses the score of the SE section was 3 (medium risk, converted to 1.5) and the RF score was 13. The analysis identified the objective RFs associated with WPV occurrence, which led us to suggest organizational and environmental interventions for reducing the sources of risk among HCWs and to prioritize the interventions targeted at the problematical issues detected by the ED WPV-Q.

Discussion

The Delphi technique allowed us to achieve consensus among experts regarding WPV and a valid, structured, and reliable questionnaire was developed. The ED WPV-Q was used to assess the risk of WPV in a hospital ED and showed a medium level of risk for both physicians and nurses. The questionnaire allowed us to identify improvement actions targeted at specific critical issues which could be minimized through strategic interventions. In particular, we found that among both physicians and nurses the risk of WPV was related to specific issues detected by the ED WPV-Q, which helped us prioritize corrective interventions on an engineering level (i.e. absence of areas for patients/clients to de-escalate, absence of alarm systems) and regarding the organizational environment (i.e. absence of a Workplace Violence Task Force to assess WPV risk and develop solutions, working

Table 1 - Delphi round I: Emergency Department Workplace Violence –Questionnaire (EDWPV-Q)

1. Sentinel events (SE):

	Decreased (score = 0)	Unchanged (score = 1)	Increased (score = 2)	IC 95%
1) Occurrence of WPV (*)	0	1	2	3,56-4,71
2) Staff turnover (**) (No. of employees leaving/total No. of employees)	0	1	2	3,76-4,88
3) Work-related stress risk (***)	0	1	2	4,12-4,88
4) Unusedvacations(**)	0	1	2	2,81-3,78 Reassessedin round 2
5) Over working time(**)	0	1	2	2,65-3,53 Reassessedin round 2

Conversion of SE scores and detection of areas of risk.

Score	0 - 3	4-7	>7	IC 95%
Score conversion	1,00	1,50	2,00	3,12-4,88
Area of risk	Low	Medium	High	5,00-5,00

2. Risk Factors(RF): organizational and environmental factors of WPV risk:

	Yes	No	IC 95%
1) Working alone	1	0	3,86-4,54
2) Rest periods between consecutive shifts (>11 hours)	0	1	3,11-4,50
3) Rest day after night Shift	0	1	3,31-4,60
4) Workplace Violence Task Force to assess the problem and develop solutions	0	1	3,70-4,60
5) Workplace inspections targeted on workplace violence prevention	0	1	3,60-4,28
6) Responsive, timely information to those waiting	0	1	3,41-4,34
7) Security officers	0	1	4,12-4,88
8) Employees are trained on workplace violence	0	1	4,10-4,60
9) Action plans aimed to assess prior every patient/client for the risk of being violent	0	1	3,57-4,63
10) All workers are required to report workplace violence to the supervisor or manager	0	1	3,61-4,12
11) Bright and effective Lighting	0	1	3,57-4,61
12) The waiting room is Spacious	0	1	4,08-4,78
13) The microclimate of the waiting room is comfortable	0	1	3,60-4,15
14) Closed-circuit video inside andoutside	0	1	3,38-4,12
15) Proper placement of nurses' stations to allow visual scanning of areas	0	1	3,51-4,60
16) Enclosed receptionist desk with bulletproof glass	0	1	3,22-4,18
17) Areas for patients/clients to de-escalate	0	1	3,40-4,08
18) Security alarm Systems	0	1	3,90-4,88

Table legends:(*) Episodes of WPV per worker, in the current biennium, compared to the previous. If not detected=0; (**) Comparison between the current biennium and the previous; (***) Assessment of WRS risk for homogeneous groups, in the current biennium, compared to the previous. If not detected=0

Workplace Violence Risk Index (WPV-R) = SE x RF

Low <12	Medium 12-24	High >24	Ic 95%
<i>Actions</i>			
Monitoring plan	Corrective measures and new assessment two years later	Corrective measures, eventually in-depth evaluation (*) and new assessment two years later	4,08-4,78

(*) This evaluation aims to gather important information on the organization's "health" through assessment of employees' perceptions.

Table 2 - Delphi round II: reassessed items for EDWPV-Q

Sentinel events	Likert score 1-2 (%)	Likert score 3-5 (%)
Unusedvacations	50	50
Over working time	40	60

Accepted as item: none

Table 3 - Emergency Department Workplace Violence – Questionnaire (EDWPV-Q): final instrument

1. Sentinel events (SE):

	Decreased (score = 0)	Unchanged (score = 1)	Increased (score = 2)
1) Occurrence of WPV (*)	0	1	2
2) Staff turnover (**) (No. of employees leaving/total No. of employees)	0	1	2
3) Work-related stress risk (***)	0	1	2

Conversion of SE scores and detection of areas of risk.

Score	0 - 2	3-4	5-6
Score conversion	1,00	1,50	2,00
Area of risk	Low	Medium	High

2. Risk Factors(RF): organizational and environmental factors of WPV risk:

	Yes	No
1) Working alone	1	0
2) Rest periods between consecutive shifts (>11 hours)	0	1
3) Rest day after night shift	0	1
4) Workplace Violence Task Force to assess the problem and develop solutions	0	1
5) Workplace inspections targeted on workplace violence prevention	0	1
6) Responsive, timely information to those waiting	0	1
7) Security officers	0	1
8) Employees are trained on workplace violence	0	1
9) Action plans aimed to assess prior every patient/client for the risk of being violent	0	1
10) All workers are required to report workplace violence to the supervisor or manager	0	1
11) Bright and effective Lighting	0	1
12) The waiting room is Spacious	0	1
13) The microclimate of the waiting room is comfortable	0	1
14) Closed-circuit video – inside and outside	0	1
15) Proper placement of nurses’ stations to allow visual scanning of areas	0	1
16) Enclosed receptionist desk with bulletproof glass	0	1
17) Areas for patients/clients to de-escalate	0	1
18) Security alarmSystems	0	1

Table legends: (*) Episodes of WPV per worker, in the current biennium, compared to the previous. If not detected=0; (**) Comparison between the current biennium and the previous; (***) Assessment of WRS risk for homogeneous groups, in the current biennium, compared to the previous. If not detected=0

Workplace Violence Risk Index (WPV-R) = SE x RF

Low <12	Medium 12-24	High >24
Actions		
Monitoring plan	Corrective measures and new assessment two years later	Corrective measures, eventually in-depth evaluation (*) and new assessment two years later

(*) This evaluation aims to gather important information on the organization’s “health” through assessment of employees’ perceptions.

alone). In line with the available literature, the authors proposed improving the waiting room as a strategic way to minimize the risk of WPV. In fact, several studies (24, 33, 34) have shown that violent events perpetrated by patients mostly take place in the waiting room, and are related to intolerance for long waiting times and miscommunication or missing information. In line with this finding, the Occupational Safety and Health Administration (OSHA) instructions (30) underline the need to improve information access to waiting patients. According to England et al. (13), electronic boards indicating approximate waiting times may be useful to prevent WPV that may arise from long waits. Information guides and videotapes on the patient’s journey through the ED may be beneficial. Communication training for ED staff may also be useful.

With regard to interventions targeted at workers’ skills in preventing WPV, we proposed a training focused on constructing the HCW-patient relationship, improving the workers’ communication skills, accurate reporting of each violent incident, and improving the labor context through management commitment and employee involvement in a WPV prevention program. According to Wu et al. (23), training based only on lectures are less effective in preventing WPV as compared to WPV training programs based on interactive and dynamic learning methods. For this reason, we suggested teaching strategies such as small-group learning, interactive learning, and simulation exercises applied during

training. In fact, Wong et al. (35, 36) found that interprofessional simulation-based team training successfully increased staff ability to manage factors impacting the care of potentially aggressive patients in the ED. Moreover, this training also proved to be effective in minimizing the phenomenon of under-reporting WPV incidents. In fact, Stene et al. (37) showed an increased compliance of HCWs in reporting these violent incidents after attending an educational program for WPV aimed at encouraging WPV reporting.

Our study has several limitations. Firstly, the analysis is based on objective evaluation of WPV risk without consequent subjective analysis. However, some authors report that this type of evaluation is better than subjective analysis because it is not influenced by felt risk (38). Secondly, the questionnaire is focused only on work organization and physical work environment, and therefore this study did not include factors associated with the perpetrators of WPV or the workers’ perception of WPV risk. In spite of this limitation, based on the occupational health principle of “hierarchy of controls”, it is likely that interventions aimed at the work organization or the physical work environment may produce more sustainable effects on the health of employees compared to interventions focused primarily on individual-level characteristics (39). Thirdly, the analysis of staff turnover and the occurrence rate of WPV was conducted by comparing only two couples of years, which might influence the precision of the findings.

Conclusions

The ED WPV-Q proved to be a valid and reliable tool to analyze WPV risk in one hospital ED. This pilot study demonstrated the effectiveness and feasibility of the introduced questionnaire in approaching this issue through the analysis of quantitative data involving indicators (SE, RF) of WPV risk. The findings were also useful in prioritizing and implementing strategic interventions aimed at reducing the risk of WPV. -

Further studies will be necessary to verify the effectiveness of the proposed ED WPV-Q in the preliminary assessment of WPV risk among HCWs employed in hospital EDs. To ensure its applicability, the method should actively involve the company occupational safety and health professionals, as well as head physicians and head nurses.

Key points

The current state of scientific knowledge on workplace violence (WPV) indicates that prior to our survey no assessment questionnaire existed to evaluate the level of type II WPV risk in emergency departments.

The Emergency Department Workplace Violence – Questionnaire (ED WPV-Q) proved to be a valid and reliable tool to analyze WPV risk in a hospital emergency department.

The organizational environment and engineering level interventions identified by the ED WPV-Q proved to be effective in minimizing the level of type II WPV risk.

Conflict of interest

The authors report no conflict of interest

Riassunto

Valutazione preliminare del rischio di violenza nei dipartimenti ospedalieri di emergenza

Introduzione. La valutazione del rischio di violenza nei dipartimenti di emergenza rappresenta una sfida sia per le organizzazioni sanitarie che per i lavoratori, globalmente. Alcuni studi hanno rivelato un aumento della frequenza del fenomeno a danno di medici ed infermieri dei dipartimenti di emergenza, in particolare della violenza di tipologia II, così come definita dal National Institute for Occupational Safety and Health. L'obiettivo del presente studio è quello di sviluppare un metodo per

la valutazione preliminare del rischio violenza di tipo II nei dipartimenti di emergenza.

Metodi. È stato utilizzato il metodo Delphi per progettare un questionario denominato “Emergency Department Workplace Violence”, suddiviso in due sezioni: 1) Eventi Sentinella; 2) Fattori di Rischio. Gli autori hanno utilizzato il questionario “Emergency Department Workplace Violence” per la valutazione del rischio da violenza di tipo II tra medici ed infermieri di un dipartimento ospedaliero di emergenza.

Risultati. Il questionario è composto da 21 items. La sezione “Sentinel Events” è costituita da tre indicatori aziendali correlati al rischio violenza ed identifica tre aree di rischio. La sezione “Risk Factors” identifica 18 fattori organizzativi ed ambientali associati al rischio violenza. La valutazione del rischio di violenza nel dipartimento ospedaliero analizzato ha evidenziato un livello di rischio medio sia tra i medici (punteggio = 18) che tra gli infermieri (punteggio = 19.5); l'analisi ha individuato fattori di rischio oggettivo associati al rischio violenza ed ha consentito di suggerire interventi organizzativi ed ambientali mirati alle criticità rilevate dal questionario “Emergency Department Workplace Violence”. Gli interventi correttivi sono stati focalizzati sul livello ingegneristico (assenza di aree per la diminuzione dell'aggressività di pazienti/utenti; assenza di sistemi di allarme) ed organizzativo (assenza del gruppo di lavoro aziendale per la valutazione e prevenzione del rischio violenza, lavoro in solitudine).

Conclusioni. Il questionario proposto è risultato uno strumento valido, strutturato ed affidabile nell'approccio alla valutazione del rischio violenza nel dipartimento di emergenza ed ha consentito di identificare interventi migliorativi mirati a specifiche criticità minimizzabili attraverso interventi strategici.

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