HHS Public Access

Author manuscript

J Occup Environ Med. Author manuscript; available in PMC 2020 December 03.

Published in final edited form as:

J Occup Environ Med. 2020 December ; 62(12): e716–e724. doi:10.1097/JOM.0000000000002036.

Effects of a Workplace Violence Intervention on Hospital Employee Perceptions of Organizational Safety

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Abstract

Objective.—To examine hospital employee perceptions of organizational safety one-year following a workplace violence intervention and to evaluate perceptions based on violence exposure status.

Methods.—In 2014, 343 employees across 41 hospital units (N = 21 control units, N = 20 intervention units) completed a questionnaire capturing organizational safety perceptions and violence exposure.

Results.—Intervention unit employees reported more positive perceptions of organizational safety compared to control unit employees. However, intervention group employees who experienced patient-to-worker violence (Type II) had significantly more positive perceptions than those who experienced worker-to-worker violence (Type III).

Conclusions.—Organizational safety perceptions improved following a violence-prevention intervention, especially among employees who reported Type II violence. Certain employees report worsened safety perceptions. Hospitals and units that implement violence prevention interventions should strive to address all types of violent behavior.

Keywords

Violence; safety; healthcare; climate; intervention

Background

Healthcare workers both within the U.S.[1] and globally[2,3,4] are at increased risk for violence-related injuries compared to other industries, with statistics indicating an increasing trend in recent years.[5,6] The negative impact that workplace violence has on hospital employees cannot be understated. Exposure is linked to both physical injury and fatalities,[7,8] and to negative psychological outcomes, including decreased well-being and job,[9] and increased depression, post-traumatic stress disorder symptoms,[10] and employee turnover.[11,12]These

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Conflicts of Interest: The authors have no competing interests/conflicts of interest.

outcomes reflect both harm to victims and serious consequences to the healthcare organization. Since hospital employees are responsible for the lives of others, exposure to violent behavior undermines the integrity of a hospital, leading to mistakes that may result in decreased safety for patients.[13]

Researchers distinguish different types of violence based on the perpetrator. Violence from patients and patient family members are labeled as Type II incidents.[14] Type III incidents, or violence from coworkers, have also been identified as an issue within healthcare.[14] However, interventions designed to reduce violence are difficult to develop for many reasons[15] and may be ineffective due to the variety of perpetrators, types of violence, and underreporting of incidents.[16] Moreover, hospital unit environments may be challenging for intervention implementation because of a sense of inertia that comes from a tendency among employees to normalize violence.[17] In their guidelines for workplace violence prevention, the U.S. Occupational Safety and Health Administration (OSHA)[18] includes 5 key elements that should be included in all violence prevention programs in healthcare settings. These include (1) management commitment and employee participation; (2) worksite analysis; (3) hazard prevention and control; (4) safety and health training; and (5) recordkeeping and program evaluation. In order to be successful, interventions must account for the different, complex, and multi-level issues that may contribute to violence within each organization.

Violence Prevention Interventions and Organizational Safety

Recent research has shown that data-driven, unit-level interventions can effectively reduce patient-to-worker violence in hospitals. In a cluster randomized trial across 47 hospital units in a multi-hospital system, Arnetz et al.[19] found significantly lower rates of Type II violent incidents and violence-related injuries for workers in intervention units compared to controls. Their intervention was initiated with a 45-minute unit walkthrough, where supervisors were presented with unit level violence data compared with hospital level data. Supervisors were then tasked with developing an action plan, using a checklist based on the OSHA violence prevention guidelines, in collaboration with their unit staff. The intervention was deemed feasible, practical, and user-friendly among intervention unit supervisors.[15] Although effectiveness and feasibility are important, interventions also need to be considered for their impact on broader contextual factors that may facilitate or hinder the long-term impact of the intervention.[20,21] Yet most of the research on interventions evaluates the more immediate, specific, and objective outcomes such as violence incidence rates and total number of incidents.[22] Relatively little is known about how interventions may be related to differences in employees' general perceptions of the safety of their work environment following an intervention. An early Swedish study found that employees in a violence prevention intervention group reported a better awareness of risk factors for violence, as well as how potentially violent situations could be mitigated or avoided, compared to controls.[23] However, the literature to date offers relatively limited empirical insight on the organizational safety perceptions of employees following an intervention. Specifically, did employees perceive themselves as safer, and their unit more effective at handling violence, following the intervention?

Recent studies have shifted toward approaching the role of contextual factors as either supporting or undermining interventions, rather than treating contextual effects as extraneous.[24,25,26] Because interventions alter a hospital's structures and processes, they may impact the work of employees and staff within the unit. Therefore, employees' perceptions should shift according to the degree to which they perceive their safety values and needs are met and they perceive an improvement following the intervention implementation.[27] The success of an intervention is a function of both its ability to provide necessary resources for implementation and the hospital and unit's climate prior to and during implementation.[28] If a violence prevention intervention reduces violence and is perceived as feasible and practical but does not enhance employees' general perceptions of their workplace safety, then the benefits of the intervention will likely be short-lived. Moreover, there is an increased risk that employees may revert to the pre-intervention practices that normalize violence. Thus, it is critical for us to understand how violence prevention interventions may have broader implications for employees' perceptions of organizational safety factors in order to establish a comprehensive understanding of the overall intervention effects.

Organizational Safety Factors

Numerous organizational safety factors have been linked to health care workers' exposure to workplace violence, both physical and non-physical. These include organizational safety climate, violence prevention climate, as well as work stress and interactions between co-workers.[29,30] Safety climate refers to employees' perceptions and beliefs about the organization's focus on, and support for, safety.[31,32] Violence prevention climate refers to employees' perceptions of organizational policies, practices, and procedures concerning the control and the elimination of violence at work[33]. Both safety and violence prevention climate perceptions may inform how quickly and effectively violence is handled both within units and at the hospital, and whether employees perceive their hospital as capable of addressing and controlling violence.[34] Differences in these climate perceptions can manifest due to individual perceptions regarding the intervention's processes. As such, safety and violence prevention climate perceptions may have implications for how future violence incidents are handled, and how employees may react to future interventions.

Similarly, interpersonal factors such as conflict and teamwork have been linked to violence exposure. Conflict and incivility amongst coworkers are distressing for employees and have been linked to poorer performance and patient outcomes,[35,36] and to physical and verbal violence.[37,38] Teamwork has been found to mediate the effects of management commitment to safety on rates of injury[39]. Workplaces that are committed to keeping employees safe must foster teamwork amongst employees to ensure the maintenance of effective safety-specific communication and cohesion.[40,41] Lastly, greater perceived workload is linked to higher rates of violence incidents because high work demands may lead to work-around behaviors,[42,43] such that employees compromise their safety compliance behaviors in order to meet the work demands.[44] Together, these factors have important implications for how employees will adhere and react to intervention procedures and help evaluate employees' overall bandwidth for safety maintenance following the intervention.

Current Study

The current study seeks to examine the effects of a data-driven, unit-level workplace violence intervention on employees' perceptions of organizational and interpersonal factors related to workplace safety. Specifically, we investigate whether differences in these organizational and interpersonal factors exist between the intervention and control groups using survey data collected one-year post intervention. The purpose of this study was to extend prior violence prevention intervention studies using administrative data by including self-reported perceptions of organizational safety. Further, we examine whether employees with different violence exposure experiences (i.e., no violence exposure, Type II exposure, Type III exposure, and both Type II and III exposure) during the intervention period report different levels of organizational and interpersonal work characteristics. We posit that the violence prevention intervention should have a more positive impact on employees' perceptions of the workplace safety factors for those in the intervention units compared to the control units. Further, we posit that the intervention's positive effects on these perceptions will be greater for employees who have reported being exposed to Type II, Type III, or both Type II and Type III violence due to the intervention fitting the perceived needs of staff who were exposed to violence during the intervention period.

Methods

Setting and Participants

This study used data from a randomized-controlled clustered intervention study designed to reduce incidents of violence against workers in 41 hospital units identified as high risk for violence. The study was conducted 2013–2014 within a multi-site hospital system in the Midwest United States with approximately 15,000 employees. For in-depth discussion of this study's intervention development philosophy and implementation procedures, refer to Arnetz et al.[19] and Hamblin et al.[15] The 41 hospital units were categorized by work discipline (type of care) into blocks and randomly assigned to the intervention (21 units) or the control (20 units) group.

Data Collection procedures.

One-year post-intervention, in the spring of 2014, employees within the 41 units ($N = 2010$) were asked to respond to a questionnaire survey regarding violence exposure in the workplace. Questionnaires were mailed to employees with a cover letter describing the purpose of the study and informing them that responses were voluntary and confidential. Each questionnaire was coded with an identification number that allowed researchers to identify respondents from a master list. A $10 gift card was offered as an incentive for participation. Two weeks after the first mailing, reminders and questionnaires were re-sent to non-respondents. After employees returned the questionnaire and were mailed their gift cards, the list linking identification with respondent numbers and addresses was destroyed. A total of 89 questionnaires could not be delivered as addressed and were returned to the research team. Of the 1921 staff that received the questionnaire, 343 employees responded, for an overall response rate of 18%.

Ethical approval for this study was granted by the Institutional Review Board of the university and the Research Review Council of the hospital system.

Measures

Demographics.—The questionnaire included socio-demographics and background items, including age, gender, job category, and work discipline within the hospital.

Violence exposure.—Employees were asked to report whether they had been the target of violence or aggression at work during the past year, with response alternatives of “no, never,” “yes, once or twice,” and “yes, several times.” The definition of violence provided to respondents was “acts or threats of physical or verbal aggression at work.” Respondents were also asked to report the perpetrator of the violence (patient, patient relative/visitor, hospital staff, manager/supervisor, and other).

Safety climate.—The dimensions of safety climate, which included organizational learning, feedback, management support, and teamwork, were measured using scales adapted from the Hospital Survey on Patient Safety Culture.[45] Feedback and Communication about violent events (referred to as Feedback) was measured using three items (sample item is “we are informed about violent incidents that happen in this unit”; Cronbach’s alpha = .89). Feedback was rated on a five-point scale from 1 (never) to 5 (always). A high score on feedback indicated perceptions of continuous feedback and communication. Organizational learning was assessed using three items (sample item is “We are actively doing things to reduce workplace violence”; Cronbach’s alpha = .92). Management support for safety was assessed using three items (sample item is “Unit management provides a work climate that promotes workplace safety”; Cronbach’s alpha = .54). The original scale included three items; however, investigation of the items revealed that removing the item: “the actions of unit management show that safety is a top priority” increased the Cronbach’s alpha to .91. Therefore, this one item was removed from the scale, resulting in a final scale that included 2 items.[39] Lastly, teamwork was assessed using 4 items (sample item is “when a lot of work needs to be done quickly, we work together as a team to get the work done”; Cronbach’s alpha = .92). Organizational learning, management support, and teamwork perceptions were rated on a five-point scale from 1 = strongly disagree to 5 = strongly agree, where higher scores signal greater perceptions of organizational learning, management support, and teamwork.

Violence prevention climate.—Violence prevention climate was measured using the practices subscale used by Yang, Spector, Chang, Gallant-Roman, and Powell[30]. Their four-item scale is adapted from Kessler, Spector, Chang, and Parr’s[46] violence prevention climate measure (Cronbach’s alpha = .90). A sample item is “reports of violence from other employees are taken seriously by management.” Violence prevention climate perceptions were rated on a five-point scale from 1 = strongly disagree to 5 = strongly agree, where a higher score indicates more positive perceptions of hospital violence prevention climate.

Interpersonal conflict.—Interpersonal conflict was measured using Sliter, Sliter, and Jex’s[47] measure. The scale included four items (Cronbach’s alpha = .85). A sample item is,

"How often do coworkers ignore or exclude you at work?" Conflict was rated on a five-point scale from 1 = strongly disagree to 5 = strongly agree, where a higher score indicated greater conflict.

Work stress.—Work stress was measured using a subscale of the Quality Work Competence (QWC) questionnaire.[48,49] The scale included four items related to adequate time to prepare, carry out, and reflect over work tasks (Cronbach's alpha = .85). A sample item is "Do you have enough time to carry out your work tasks?" Items were rated on a four-point response scale ranging from 1 = often to 4 = never, with higher scores representing higher levels of stress. Stress scores were calculated by totaling the scores on the four component items and converting that sum to a percentage of the maximum possible score.

Data analysis

All analyses were conducted using SPSS 25.[50] Chi-square analyses were conducted to compare intervention and control group participants on demographic characteristics as well as reported experience with workplace violence in the past year. Chi-square analysis was also used to compare survey respondents with the total population of employees of the 41 study units in terms of age, gender, job category, and job tenure.

Dependent variables were self-reported perceptions of organizational learning– continuous improvement, feedback and communication, management support, teamwork, violence prevention climate, work stress, and interpersonal conflict. Comparison between intervention and control units was tested through a dichotomous variable for condition (0 = control, 1 = intervention). Violence exposure status was based on participants' self-reported questionnaire response to whether they had experienced violence at work in the past year. Despite three response options to self-report violence exposure (yes – once or twice, yes – several times, no), violence exposure variables were dichotomized for two primary reasons. First, the primary goal of this study was to investigate differences in perceptions according to violence exposure groups, rather than investigation of exposure frequency or severity on perceptions. Second, violence can be considered a rare event, and workers often underreport their exposure experiences.[51] Dichotomization of the exposure variables allowed us to focus and examine effects by comparing those with exposure experience versus no exposure experience in the last reporting period. Therefore, violence exposure variables were dichotomized and reflected the participant report experiencing Type II or Type III violence specifically (0 = did not experience Type II/ Type III violence, 1 = experienced Type II/Type III violence). In each set of codes, 1 refers to whether individuals reported experiencing a specific type of violence. Thus, these categories are not mutually exclusive, and participants may be separated into four possible groups of no exposure (code 1= 0, code 2 = 0), exposure to Type II violence but not Type III violence (code 1 = 1, code 2 = 0), exposure to Type III violence but not Type II violence (code 1 = 0, code 2 = 1), and exposure to both Type II and Type III violence (code 1 = 1, code 2 = 1).

Bivariate analysis using Pearson's r was used to examine correlations between employee perception variables, violence exposure experiences, and intervention condition. Next, differences in organizational outcomes between the intervention and control groups, as well

as by type of violence exposure, were examined separately with t-tests and Cohen's d as a measure of effect size. Cohen's d captures the standardized magnitude of differences between two groups and compares differences in perceptions between intervention and control conditions and between participants exposed to violence versus those with no exposure beyond statistical significance. Typically, a Cohen's d effect of $d = .2$ is considered small, $d = .5$ is moderate, and $d = .8$ is large.

Finally, a 2 (intervention × control) by 2 (no Type II exposure × Type II exposure) by 2 (no Type III exposure × Type III exposure) between-subjects factorial ANOVA was conducted to investigate differences in organizational and interpersonal factors by simultaneously considering the intervention and exposure effects. There are several benefits of conducting a 2×2×2 ANOVA for this study. As mentioned, the focus of this study concerns the investigation of differences across three discrete grouping variables. Specifically, under the intervention and control conditions, respectively, the exposure coding can further distinguish participants into four groups based on the exposure experience: no exposure, Type II exposure, Type III exposure, and both Type II and III exposure. In this case, ANOVA allows us to simultaneously compare the differences in the organizational safety perceptions across these 8 groups (2 conditions × 4 violence exposures). Effects of the intervention (vs. control) on participants' perceptions of organizational safety can then be evaluated by examining patterns of differences across violence exposure groups. Lastly, simple slope analyses were conducted to test significant differences by condition across groups. A significant simple slope signifies that the group difference between condition and intervention is statistically significant.

Results

Characteristics of employee respondents and sample sizes in the 41 units are reported in Table 1. Chi-square tests showed that there were significant differences between employees in the control and intervention conditions in their job category ($p < .05$), with a larger proportion of intervention group employees working as 'other' technicians (3.1% vs. 0%) and as physical, occupational, and speech therapists (8.8% vs. 0%). Further, intervention group employees were less likely to report being a target of violence at work overall (29.1% vs. 42.8%) but were more likely to report experiencing violence from a patient (55.4% vs. 41.2%, $p < .05$), compared to the control group. Chi-square analyses comparing questionnaire respondents with the total population of the 41 study units revealed no significant differences for gender ($X^2(1) = 1.04$, $p = .31$), age ($X^2(3) = 6.89$, $p = .08$), and job category ($X^2(4) = 4.55$, $p = .34$). However, significant differences emerged for job tenure ($X^2 = 10.72$, $p = .005$). The total sample had a larger proportion of employees with 0–5 years in tenure (49% vs. 40%) and smaller proportion of employees with a tenure of 10 years or greater (32% vs. 40%), with no difference in proportion for employees with a tenure of 6–10 years (19% vs. 20%).

Table 2 summarizes the bivariate correlations and descriptive statistics of all variables included in the model. Perceptions of the different organizational safety factors were significantly correlated ($p < .05$), with coefficients ranging from −.29 to .70. Correlations between the exposure to Type II violence and perceived organizational safety variables were

all significant except for feedback ($r = -.03$, $p > .05$) and teamwork ($r = -.07$, $p > .05$). Specifically, Type II violence exposure had significant relationships with organizational learning, violence prevention climate, management support, stress, and interpersonal conflict, with coefficients ranging from −.21 to .20. Correlations between the exposure to Type III violence and continuous outcomes were all significant, with coefficients ranging from −.16 to .41. Intervention condition was significantly related to management support ($r = .17$, $p < .05$) and teamwork ($r = .11$, $p < .05$), but was not significantly correlated with Type II and Type III violence exposures.

Table 3 displays mean differences and effect sizes in outcomes across condition, Type II violence exposure, and Type III violence exposure. The first set of analyses investigated mean differences in organizational factors across conditions (i.e., intervention vs. control) without consideration of type of violence exposure. Participants in the intervention condition reported significantly higher ratings of management support, ($t[341] = -3.26$, $p < .05$) and teamwork ($t[341] = -2.12$, $p < .05$) than those in the control condition. The respective effect sizes for these differences were $d = .36$ and $d = .23$, with an average $d = .18$ effect size across condition groups.

The next set of analyses investigated group differences in outcomes across all participants who reported Type II violence exposure versus those who did not (Table 3). Participants who experienced Type II violence reported significantly lower perceptions of organizational learning, ($t[341] = 3.60$, $p < .05$), violence prevention climate ($t[341] = 3.94$, $p < .05$), and management support ($t[341] = 3.85$, $p < .05$), and higher levels of work stress ($t[341] = -3.70$, $p < .05$) and interpersonal conflict ($t[341] = -2.39$, $p < .05$). The average effect size for these differences was $d = .30$, suggesting a small-to-moderate effect of Type II violence exposure on organizational safety perceptions.

Group differences in outcomes associated with Type III violence exposure were all statistically significant (Table 3). Participants who experienced Type III violence reported significantly lower levels of feedback ($t[341] = 3.45$, $p < .05$), organizational learning ($t[341] = 4.11$, $p < .05$), violence prevention climate ($t[341] = 3.22$, $p < .05$), management support ($t[341] = 2.90$, $p < .05$), and teamwork ($t[341] = 3.43$, $p < .05$), and higher levels of work stress ($t[341] = -3.60$, $p < .05$) and interpersonal conflict, ($t[341] = -8.22$, $p < .05$). The average effect size for these differences was moderate-large ($d = .66$).

Table 4 displays cell means for the 8 groups corresponding to the 2 (condition) × 2 (Type II violence exposure) × 2 (Type III violence exposure) between-subjects factorial ANOVA. This set of results examined the joint effects of the 4 possible violence exposure experiences (i.e., no exposure, Type II only, Type III only, and both Type II and Type III) and condition (i.e., intervention vs. control) on employee perceptions of organizational factors. We found a significant two-way interaction effect between condition (interaction vs. control) and Type II violence exposure (no exposure vs. Type II exposure) on management support ($F(1,332) = 4.18$, $p < .05$). Participants who were exposed to Type II violence reported higher ratings of management support in the intervention group compared to the control group; however, management support ratings did not differ between groups for those who were not exposed to Type II violence. A significant two-way interaction between condition and Type III

violence exposure emerged for violence prevention climate ($F(1,332) = 4.75$, $p < .05$). For participants who were exposed to Type III violence, those in the intervention condition reported lower violence prevention climate than those in the control condition. However, for those who were not exposed to Type III violence, participants in the intervention condition reported higher violence prevention climate than those in the control condition.

We next investigated whether three-way interactions emerged between factors. A significant three-way interaction suggests that the differences in organizational and interpersonal factors between the control and intervention group were not consistent across the four violence exposure groups. That is, the magnitude and/or direction of the difference between intervention and control groups was significantly different in at least one violence exposure group. We found a significant three-way interaction effect between intervention condition, Type II exposure, and Type III exposure on organizational learning, $F(1,332) = 3.87$ $p = .05$, teamwork, $F(1,332) = 4.26$, $p < .05$, and interpersonal conflict, $F(1,332) = 5.54$, $p < .05$. Thus, participants' ratings of these three organizational safety measures differed based on the unique combination of intervention condition and their violence exposure experiences. Figure 1 illustrates the interaction pattern for teamwork as an example. For participants with no violence exposure, those in the intervention group reported more positive perceptions of teamwork compared to those in the control group. This pattern was the same between intervention and control conditions for participants who reported Type II exposure, but to a much smaller degree. Conversely, intervention group participants who reported only Type III violence exposure had much lower perceptions of teamwork compared to controls, with a similar pattern also emerging for participants who reported exposure to both Type II and III violence. However, differences between intervention and control for this group were smaller.

Table 4 helps illustrate that the interaction pattern for organizational learning was similar to the one for teamwork. Participants who did not report violence exposure in intervention units had more positive perceptions of organizational learning compared to participants in controls. This pattern was the same for participants who reported Type II exposure. For participants who reported Type III violence exposure, those in intervention units had lower ratings of organizational learning compared to controls. Participants who reported exposure to both Type II and III violence in intervention units had higher ratings of organizational learning compared to controls.

The last significant three-way interaction was for interpersonal conflict. Participants in the intervention group who did not report violence exposure reported lower levels of interpersonal conflict compared to controls. Ratings of interpersonal conflict among participants who reported exposure to Type II violence did not differ between intervention and control groups. Among participants who reported Type III violence, the intervention group reported higher levels of conflict compared to controls. A similar pattern emerged for participants who reported both Type II and III violence exposure, but to a lesser degree.

Discussion

The aim of this study was to investigate perceptions of organizational safety factors between participants exposed to a violence-prevention intervention and controls, previously reported

by Arnetz et al.[19]This previous study used administrative data and found that violence incidence was reduced following a violence prevention intervention. This study extends these findings by including self-report data and examining whether perceptions similarly improved. We also sought to investigate whether differences in perceptions across intervention conditions were different depending on participants' reported violence exposure. Results suggest that intervention employees' organizational safety perceptions were more positive that those of controls following an intervention designed to reduce hospital violence exposure. However, employees in the intervention group who experienced Type III violence (i.e., violence from coworkers or supervisors) reported lower safety perceptions compared to those with the same exposure experience in the control group. Taken together, these findings suggest that hospitals should consider the effects of an intervention beyond objective metrics (i.e., changes in reported violence incidence), and focus on understanding the implications of the intervention on employee safety perceptions.

The first aim was to investigate whether participants exposed to a violence prevention intervention reported more positive perceptions of organizational safety compared to those in the control group. As hypothesized, employees in intervention units reported, on average, more favorable organizational safety perceptions compare to those in the control units. Although the average effect sizes of these observed differences were modest, these findings provide support for the notion that the intervention was associated with positive employee perceptions of the workplace as safer and more efficient in handling violence.

Participants exposed to the intervention within their unit reported more positive perceptions of management support and teamwork compared to controls. OSHA guidelines suggest that management commitment is a fundamental building block for a successful violence prevention program.[6] Management support sets the precedent for viewing workplace violence as a safety hazard and provides necessary motivation and resources for employees and management to effectively deal with violent incidents.[6] Further, increased trust that management is willing to address future violence incidents and keep the unit safe for employees,[52] and less fear of facing negative consequences due to reporting from employees, have been linked to increased reporting of violent events.[53] This is critical for sustaining the intervention's benefits because continuous and prompt reporting of violence exposure provides critical data to units that help employees further develop violence prevention measures specific to their needs.[54] Teamwork is considered an important component of a supportive work environment and is further considered an important resource linked to increased employee safety.[51] Prior research has also shown that employees who perceived their management as taking safety seriously felt the need to mirror the management effort in taking preventative safety measures, through perceptions of increased teamwork.[39] This suggests that employees with more positive perceptions of teamwork are more likely to match management's efforts in adhering to violence prevention guidelines and helping others adhere to them. Therefore, the intervention may have bolstered employees' sense of unity and responsibility to others in their unit, promoting greater adherence to intervention procedures.[24,26]

We also sought to investigate whether the trend of favorable safety perceptions for intervention units was the same for those with different exposure experiences. We found

support for this idea in several interactions. First, results suggest that participants who reported Type II violence and were also exposed to the intervention reported significantly more positive perceptions of management support compared to individuals who reported Type II violence and were controls. The greater benefit of intervention for those exposed to Type II violence supports the idea that the intervention was successful in communicating management's dedication and commitment to taking violence seriously and addressing it proactively within units. Our findings align with Aarons et al.,[27] who suggest that perceptions should shift in accordance to the degree to which individuals believe an intervention's implementation fulfilled their needs. In the current study, those exposed to Type II violence did report more positive organizational safety perceptions, likely because the intervention helped employees deal with violence from patients, satisfying the safety needs of employees.

Interestingly, results revealed that employees who reported Type III violence and were in intervention units reported lower organizational safety perceptions compared to those who reported Type III violence and were in control units. In this case, those exposed to the intervention did not show more positive safety perceptions, with the same pattern found for violence prevention climate, teamwork, organizational safety, and interpersonal conflict. The intervention was designed to address violence from both patients and coworkers; however, the intervention may have been better equipped to handle violence from patients and visitors compared to violence from coworkers. For instance, the OSHA guidelines offer little insights that specifically address coworker violence. This is not surprising given few hospitals have systems for documenting and monitoring Type III violence.[54] Moreover, the nature of these incidents may be more targeted and covert, making them more difficult to investigate and address.[58] However, it is notable that the lowest safety perceptions were linked to those employees reporting exposure to Type III violence. Prior research corroborates that violence from patients is frequently normalized within hospitals,[55,56] and Type III violence is not uncommon but linked to worse well-being outcomes compared to Type II incidents.[57] Thus, violence from coworkers can represent a broader culture of violence normalization that is tolerant of incidents regardless of stakeholder, undermining the purpose and design of the intervention. In this case, the presence of Type III violence may be indicative of an organizational climate that does not provide the necessary foundation to implement and sustain the effects of the intervention.[58]

Limitations

As with all research, this study features some limitations. First, the sample size of employees exposed to Type III violence exposure was small. Overall, less than 50 employees reported exposure to Type III violence, representing 14% of the sample. In exploring the three-way interaction, this group was further divided between employees who only reported Type III and those who reported both Type II and III, further shrinking the pool of participants reporting Type III violence. A low number of Type III incidents is not unexpected given that the nature of Type III violence makes these incidents illusive and difficult to capture. Nevertheless, a small sample size offers issues detecting effects for this group. A larger sample of employees would help to better understand the effects -- and magnitude of these effects -- across groups.

Another limitation concerns the dichotomization of self-reported violence exposure. Responses to violence exposure were collected by asking employees to report no, yes – once or twice, or yes – several times; but responses had to be aggregated into yes/no groups to address sample size issues. Therefore, this study does not offer insight about experienced severity and frequency of violence exposure on organizational safety perceptions.

Third, this study was cross-sectional and causal relationships cannot be determined.

Lastly, there were differences in the composition of units between controls and intervention (refer to table 1) based on those who responded to the questionnaire. Intervention unit respondents had a lower percentage of employees who reported being exposed to violence compared to controls. Specifically, a smaller proportion of intervention unit employees reported patient violence. While this provides evidence in support of the intervention's utility for reducing violence incidents, the evaluation of perceptions can be skewed toward the perceptions of control-unit employees who report violence exposure. The fewer number of employees reporting violence in intervention units may have made effects more difficult to detect due to lower power. Moreover, our questionnaire had a 18% response rate. Although previous studies using these data were able to show no differences between pre-intervention questionnaire respondents to non-respondents,[42] this study was not able to do the same. Therefore, we are unable to rule out potential effects associated with the low response rate. However, we did not detect significant differences with regards to age, gender, or job category between questionnaire respondents and the total population of workers in the 41 units. Since both age and job category are recognized risk factors for violence against healthcare workers,[59,60] it is important to note that our sample appeared to be similar to the population of hospital employees regarding important violence exposure risk factors. Therefore, this would suggest that findings are unlikely to be affected by non-response bias and may be potentially informative for understanding how the hospital workers responded to the intervention and different types of violence.

Conclusion

This study extends prior intervention studies by supplementing administrative data with employee perceptions of workplace safety. The current research suggests that the implementation of a violence prevention intervention not only affected perceptions of employees' safety post-implementation, but that these perceptions varied according to the type of violence exposure. Overall, employees in intervention units reported more positive perceptions of organizational safety compared to those in the control units. Further, employees who reported Type II violence exposure showed more positive work safety perceptions post-intervention. However, we found lower safety perceptions for intervention group employees who were exposed to Type III violence, suggesting that these employees felt less safe, despite the intervention's success in reducing the risks for Type II violence on their units. Hospitals and units considering the implementation of a violence prevention intervention should strive to include efforts to address all types of violent behavior.

Source of Funding:

This study was funded by The Centers for Disease Control-National Institute for Occupational Safety and Health [CDC-NIOSH], grant number R01 OH009948. The content is solely the responsibility of the authors and does not necessarily represent the official views of CDC-NIOSH.

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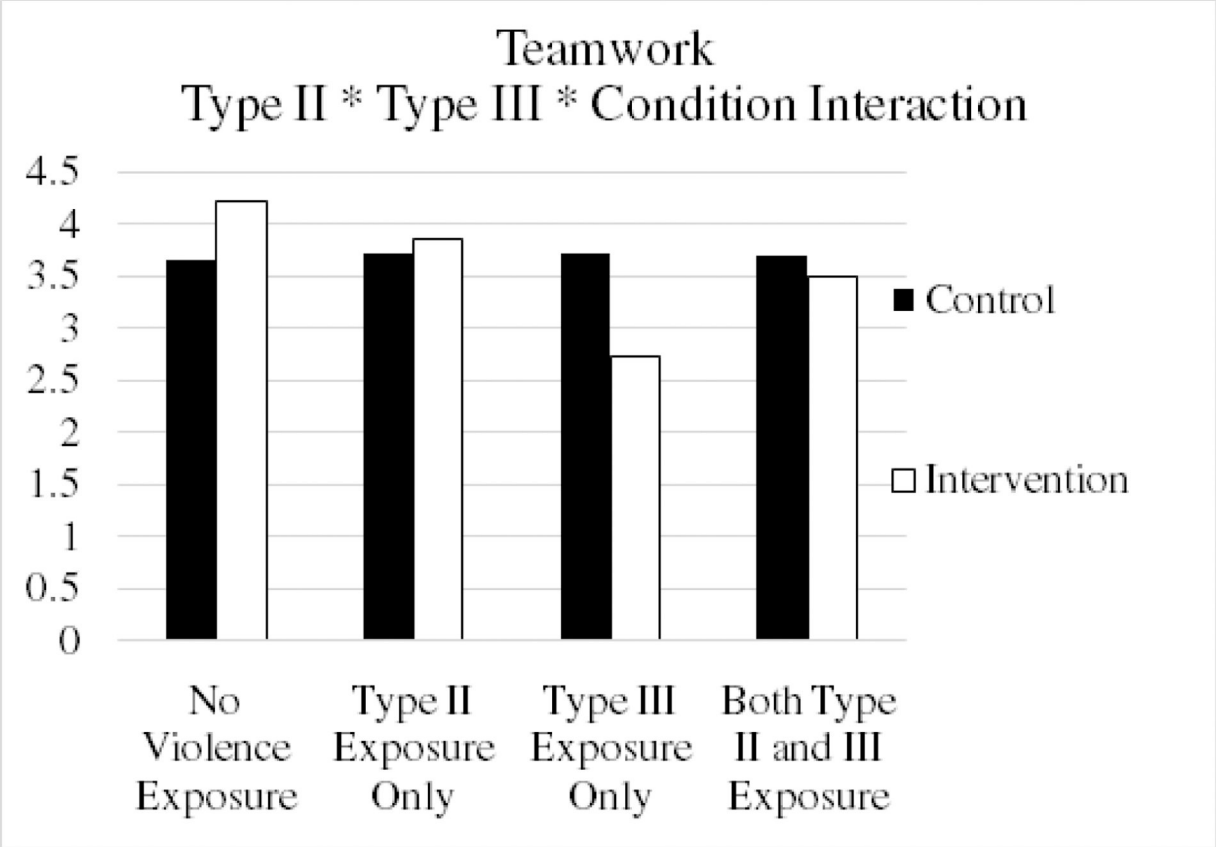

Figure 1.
The three-way interaction between condition, Type II, and Type III violence exposure on perceptions of teamwork.

Table 1.

Characteristics of Questionnaire Respondents (N = 343)

	Combined (N=343)	**Control (N=149)**	**Intervention (N=194)**	**X^2 (p-value)**
	N (%)	**N (%)**	**N (%)**	
Gender				1.86 (.17)
Male	63 (18.5)	32 (21.8)	31 (16)	
Male	63 (18.5)	32 (21.8)	31 (16)	
Female	278 (81.5)	115 (78.2)	163 (84)	
Age Group				3.72(.45)
<29 years	83 (24.3)	32 (21.6)	51 (26.4)	
30–39 years	71(20.8)	29 (19.6)	42 (21.8)	
40–49 years	72 (21.1)	35 (23.6)	37(19.2)	
>50 years	115(33.7)	52 (34.9)	63 (32.6)	
Tenure				6.60(.09)
0–5 years	138 (40.4)	54 (36.5)	84 (43.3)	
5–10 years	69(20.2)	25 (16.8)	44 (22.7)	
10–15 years	44(12.9)	25(16.9)	19 (9.8)	
>15 years	91 (26.6)	44 (29.7)	47 (24.2)	
Job Category				**27.11(<.05)**
Registered Nurse	203 (59.4)	90 (60.8)	113 (58.2)	
Nurse Practitioner/Physical assistant	1(0.3)	1 (.7)	0 (0)	
Patient Care associate	41 (12)	19 (12.8)	22(11.3)	
Physical, occupational, speech therapist	17 (5)	0 (0)	17 (8.8)	
Surgical Technician	3(0.9)	0 (0)	3(1.5)	
Mental Health Technician	4 (1.2)	3 (2.0)	1(.5)	
Other technician (EKG, lab, Radiology, etc.)	6(1.8)	0 (0)	6 (3.1)	
Unit Clerk	10 (2.9)	4 (2.7)	6 (3.1)	
Clerical/Secretary	6(1.8)	3 (2.0)	3 (1.5)	
Security	26 (7.6)	16 (10.8)	10 (5.2)	
Administration/Management	5(1.5)	2 (1.4)	3 (1.5)	
Other	20 (5.8)	10 (6.8)	10 (5.2)	
Work Discipline				9.82(.13)
Nursing	174 (50.9)	72 (48.3)	102 (52.8)	
Medicine	12(3.5)	4 (2.7)	8 (4.1)	
Emergency	87(25.4)	37 (24.8)	50 (25.9)	
Psychiatry	20 (5.8)	11 (7.4)	9 (4.7)	
Surgery	7 (2.0)	5 (3.4)	2 (1.0)	
Security	26(7.6)	16 (10.7)	10 (5.2)	
Other	16(4.7)	4 (2.7)	12 (6.2)	
	Combined (N=343)	Control (N=149)	Intervention (N=194)	X^2 (p-value)
Self-Reported Target of Violence or Aggression at Work During the Past Year[‡]	N (%)	N (%)	N (%)	**4.89(<.05)**

	Combined (N=343)	**Control (N=149)**	**Intervention (N=194)**	X^2 **(*p*-value)**
	N (%)	**N (%)**	**N (%)**	
Yes	128 (37.2%)	83 (42.8%)	46 (29.1%)	
No	214 (62.8%)	111 (57.2%)	102 (70.9%)	
Perpetrator of Violent or Aggressive Behavior[##]				
Patient	162 (47.2%)	80(41.2%)	82(55.4%)	**6.76 (<.05)**
Patient relative/visitor	98 (28.6%)	55(28.4%)	43(29.1%)	.02(89)
Hospital staff	39 (11.4%)	23(11.9%)	16(10.8%)	.09(.76)
Manager/ supervisor	10 (2.9%)	6(.31%)	4(2.7%)	.05(.83)
Other	8 (2.3%)	4(2.1%)	4(2.7%)	.15(.70)
I wasn't a target of violence or aggression	128 (62.6%)	113(58.2%)	102(67.8%)	**4.49(<.05)**

Note.

[‡]Violence was defined as "acts or threats of physical or verbal aggression";

[##]Multiple responses were possible on these questions.

Table 2.

Means, standard deviations, and bivariate relationships for organizational safety variables and factors

Variables	Mean (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Feedback	2.89 (1.25)	***.89***									
2.Organizational learning – Continuous Improvement	2.94 (1.03)	.70*	***.92***								
3. Violence Prevention Climate	3.54 (.91)	.61*	.68*	***.90***							
4. Management Support	3.09 (.84)	.40*	.51*	.53*	***.92***						
5. Teamwork	3.80 (.93)	.31*	.43*	.45*	.44*	***.90***					
6. Work Stress	31.55 (18.71)	−.35*	−.40*	−.42*	−.28*	−.33*	***.85***				
7. Interpersonal Conflict	1.87 (.71)	−.29*	−.32*	−.36*	−.35*	−.58*	.35*	***.85***			
8. Type II Violence	.55 (.50)	−.03	−.19*	−.21*	−.21*	−.07	.20*	.13*	—		
9. Type III Violence	.13 (.34)	−.18*	−.22*	−.17*	−.16*	−.18*	.19*	.41*	−.05	—	
10. Condition	.57 (.50)	.07	.08	.08	.17*	.11*	−.07	−.04	−.10	.01	—

Note. $N = 343$,

* $p < .05$.

Cronbach's alpha values reported on the diagonal; Type II violence: 0 = no Type II violence exposure, 1 = Type II violence exposure; Type III violence: 0 = no Type III violence exposure, 1 = Type III violence exposure; Condition: 0 = Control group, 1 = intervention condition.

Table 3.

Means and One-Way ANOVA Significance Testing of Organizational Safety Variables across Intervention Conditions and Exposure Experiences

	Condition			
Outcomes	**Control (*N* = 149)**	**Intervention (*N*=194)**	***t*-value**	**Cohen's *d***
1.Incident feedback	2.79 (.15)	2.97 (.16)	−1.33	.15
2.Organizational learning	2.84 (.15)	3.01 (.16)	−1.53	.17
3. Violence Prevention Climate	3.45 (.19)	3.61 (.19)	−1.55	.17
4. Management Support	**3.05 (.16)**	**3.45 (.19)**	**−3.26**	**.36**
5. Teamwork	**3.70 (.20)**	**3.93 (.21)**	**−2.12**	**.23**
6. Work Stress	33 (1.78)	30.45 (1.64)	1.24	−.14
7. Interpersonal Conflict	1.90 (.10)	1.85 (.10)	.66	−.07
	Type II Violence Exposure			
	No (*N* = 153)	**Yes (*N* = 189)**	***t*-value**	**Cohen's *d***
1.Incident feedback	2.94 (.16)	2.86 (.15)	.59	−.06
2.Organizational learning	**3.16 (.17)**	**2.76 (.15)**	**3.60**	**−.39**
3. Violence Prevention Climate	**3.75 (.20)**	**3.37 (.18)**	**3.94**	**−.43**
4. Management Support	**3.54 (.19)**	**3.07 (.17)**	**3.85**	**−.42**
5. Teamwork	3.91 (.21)	3.77 (.20)	1.37	−.15
6. Work Stress	**27.41 (1.48)**	**34.83 (1.88)**	**−3.70**	**.4**
7. Interpersonal Conflict	**1.77 (.10)**	**1.96 (.11)**	**−2.39**	**.26**
	Type III Violence exposure			
	No (*N* = 297)	**Yes (*N* = 45)**	***t*-value**	**Cohen's *d***
1.Incident feedback	**2.98 (.16)**	**2.30 (.12)**	**3.45**	**−.55**
2.Organizational learning	**3.02 (.16)**	**2.36 (.13)**	**4.11**	**−.66**
3. Violence Prevention Climate	**3.60 (.19)**	**3.14 (.17)**	**3.22**	**−.52**
4. Management Support	**3.35 (.18)**	**2.83 (.15)**	**2.90**	**−.46**
5. Teamwork	**3.9 (.21)**	**3.38 (.18)**	**3.43**	**−.55**
6. Work Stress	**30.12 (1.63)**	**40.74 (2.20)**	**−3.60**	**.58**
7. Interpersonal Conflict	**1.76 (.10)**	**2.61 (.15)**	**−8.22**	**1.32**

Note. Bolded mean values are significantly different at the $p < .05$ level.

Table 4.

Cell mean differences in organizational safety for the 2 (condition) × 2 (Type II violence) × 2 (Type III violence) ANOVA

	Violence exposure status	Control (SE)	Intervention (SE)
Incident feedback	No violence exposure	3.04 (.18)	3.15 (.13)
	Only Type II exposure	2.73 (.14)	3.06 (.13)
	Only Type III exposure	2.46 (.37)	1.69 (.35)
	Both Type II & III	2.71 (.43)	2.48 (.33)
Organizational learning	No violence exposure	3.25 (.14)	3.37 (.14)
	Only Type II exposure	2.66 (.11)	2.91 (.11)
	Only Type III exposure	2.76 (.29)	1.68 (.28)
	Both Type II & III	2.33 (.34)	2.64 (.26)
Violence Prevention Climate	No violence exposure	3.74 (.13)	3.95 (.10)
	Only Type II exposure	3.29 (.01)	3.48 (.09)
	Only Type III exposure	3.36 (.26)	2.8 (.25)
	Both Type II & III	3.50 (.31)	3.11 (.23)
Management Support	No violence exposure	3.52 (.16)	3.75 (.12)
	Only Type II exposure	2.80 (.12)	3.36 (.12)
	Only Type III exposure	3.14 (.32)	2.33 (.31)
	Both Type II & III	2.63 (.37)	3.14 (.28)
Teamwork	No violence exposure	3.66 (.13)	4.23 (.10)
	Only Type II exposure	3.73 (.10)	3.87 (.10)
	Only Type III exposure	3.73 (.26)	2.72 (.26)
	Both Type II & III	3.71 (.32)	3.50 (.24)
Work stress	No violence exposure	28.26 (2.63)	22.59 (1.96)
	Only Type II exposure	33.75 (1.98)	35.29 (1.36)
	Only Type III exposure	46.12 (5.38)	40.28 (5.15)
	Both Type II & III	36.46 (6.31)	39.29 (4.77)
Interpersonal conflict	No violence exposure	1.78 (.09)	1.55 (.07)
	Only Type II exposure	1.89 (.07)	1.85 (.07)
	Only Type III exposure	2.16 (.19)	3.00 (.18)
	Both Type II & III	2.59 (.22)	2.66 (.17)