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Security Measures to Protect Healthcare Workers and Patients against Violence in Nursing Environments: A Comprehensive Review

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Abstract

Background: Workplace violence against nurses is a critical global public health and occupational hazard. Ranging from verbal abuse to physical assault, the consequences of WPV are severe physical and psychological injuries, burnout, high staff turnover, and diminished quality of care for patients. High-risk areas include emergency and psychiatric units.

Aim: This review aims to synthesise literature from 2015 to 2025 and establish the effectiveness of various security measures instituted in clinical environments with the aim of protecting nurses and patients from violence.

Methods: A systematic search of PubMed, CINAHL, PsycINFO, and Scopus was conducted for peer-reviewed studies from 2015 to 2024 using keywords related to the topic, including "workplace violence," "nurses," "intervention," and "security measures." A total of 40 qualifying quantitative, qualitative, and mixed-methods studies were included and analyzed using the method of narrative synthesis.

Results: Interventions were categorized as primary (prevention), secondary (response), and tertiary (post-event) strategies. The most effective primary measures included comprehensive violence prevention programs, de-escalation training, and environmental designs, such as panic buttons. Secondary measures, including emergency response teams, were effective when deployed promptly. Tertiary support, such as debriefing and counseling, was crucial for mitigating long-term effects. Major implementation barriers included inconsistent training, underreporting, and cultural acceptance of violence.

Conclusions: What works is an integrated, multicomponent strategy that incorporates proactive, responsive, and supportive interventions. From the leadership perspective, a safety culture should be developed that emphasizes prevention, reporting, and support of staff. Recommendations for future research include standardization of outcomes, longitudinal analysis, and consideration of predictive technologies such as AI.

Keywords: workplace violence, nurses, violence prevention, security measures, healthcare safety

Introduction

Workplace violence (WPV) in healthcare is a serious and persistent problem worldwide. Nurses have been described as the obvious victims of this phenomenon. According to the Conseil international des infirmières (1999, the ILO, WHO, and ICN jointly recognized violence in the health sector as a major public health problem. WPV can take many different forms: non-physical violence includes verbal abuse, bullying, harassment, and threats, while physical violence encompasses an assault directly against the person (McGuire et al., 2022). The perpetrators may include patients, their families, visitors, and, shockingly, even colleagues within the healthcare system itself. The nursing profession is uniquely vulnerable due to the intimate, high-stakes, and often stressful nature of patient interactions, particularly in environments where patients may be in pain, afraid, frustrated, or psychologically distressed (Vidal-Alves et al., 2020).

The prevalence rates are alarming. A systematic review and meta-analysis by Liu et al. (2019) found that the global pooled prevalence of workplace violence against nurses was 61.9%, with the most prevalent form being verbal abuse. The consequences of this endemic violence are multifaceted and profound. On an individual level, nurses may suffer physical injuries, ranging from minor bruises to life-threatening harm (Arnetz et al., 2015). The psychological sequelae are often more debilitating and long-lasting, including symptoms of post-traumatic stress disorder (PTSD), anxiety, depression, burnout, and moral injury (Copeland & Henry, 2017). These personal tolls inevitably translate into organizational and systemic deficits, manifesting as high staff turnover, absenteeism, decreased job satisfaction, and, ultimately, a reduction in the quality

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and safety of patient care (Roche et al., 2010). When nurses practice in an environment of fear, their ability to provide compassionate, effective care is severely compromised, creating a vicious cycle that erodes the very foundation of the healthcare system.

This critical challenge has meant that there is a wide array of security measures and interventions proposed and implemented across healthcare settings. This includes administrative controls like zero-tolerance policies and staffing adjustments, environmental modifications such as improving lighting and access control systems, to behavioral interventions like de-escalation training (Gillespie et al., 2017). However, their performance is variable and often depends on the context. There remains a significant gap between the implementation of policies and their consistent, effective application in the dynamic and complex reality of clinical nursing environments (Xu et al., 2020).

This systematic review aims to synthesize the current literature from 2015 through 2024 in order to critically assess the effectiveness of security measures implemented to protect nurses and patients against violence in healthcare settings. The review also aims to classify these interventions, examine the evidence supporting the effectiveness of each intervention, identify key barriers and facilitators to successful implementation, and provide evidence-based recommendations for practice and future research.

Methods

Search Strategy

A systematic literature search was carried out in July 2024 across four major electronic databases: PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PsycINFO, and Scopus. The search strategy was designed to capture all relevant literature published between January 2015 and July 2024. Key search terms and their Boolean combinations included: ("workplace violence" OR "violence against nurses" OR "aggression") AND ("nurs" OR "healthcare worker") AND ("intervention" OR "prevention" OR "security measure*" OR "de-escalation" OR "zero tolerance" OR "training" OR "environmental design") AND ("hospital" OR "healthcare setting" OR "nursing environment").

Inclusion and Exclusion Criteria

We included studies that: (1) were original, peerreviewed research articles in any of the following designs: quantitative, qualitative, or mixed-methods; (2) focused specifically on nurses or nursing environments; (3) evaluated one or more security or violence prevention interventions; (4) were published in English between 2015 and 2024; and (5) reported empirical data on the outcomes, processes, or perceptions associated with interventions. Studies were excluded if they were: (1) review articles, editorials, or conference abstracts, though their lists of references were scanned for possible sources; (2) focused exclusively on violence between colleagues (ie, bullying/mobbing) without coverage of patient/visitor violence; (3) not primarily designed to evaluate an intervention; or (4) published before 2015.

Data Synthesis

A meta-analysis was not possible due to heterogeneity in study designs, interventions, and outcome measures; therefore, a narrative synthesis approach was used. Data extracted thematically analyzed interventions, which were categorized into a three-tiered prevention model: primary prevention-avoiding violence before it happens, secondary prevention-managing and responding to violent events in progress, and tertiary prevention-providing post-event support and mitigating long-term consequences (Hahn et al., 2012).

Results

Synthesis of the reviewed studies indicated that mitigating violence in nursing environments is complex and multifaceted. The findings below are organized according to the three-tiered prevention model.

Primary Prevention: Proactive Strategies to Prevent Violence

Primary prevention focuses on preventing violence before it occurs by removing the root causes. It is considered the most effective and desirable approach.

Organizational and Administrative Controls

A foundation of primary prevention is to create a solid organizational commitment to a workplace free of violence. Several studies emphasized the need for an adequate Workplace Violence Prevention Program. Such programs, when effectively implemented with leadership support, resulted in significant decreases in violent events and positive nurse perceptions of safety (Marquez et al., 2020). Elements of effective WVPPs include a clearly stated and communicated "zero-tolerance" policy that is consistently applied to patients and visitors (Beattie et al., 2020). However, multiple studies warned that without an enabling culture that empowers nurses to report incidents without fear of blame or reprisal, a policy in itself is inadequate (Edward et al., 2016).

Another critical administrative control is proper staffing and workload management. Research consistently shows that high nurse-to-patient ratios are associated with burnout and the incidence of violence (Bae, 2024). In addition, overworked nurses have less time for each patient, which means poor communication, frustrated patients, and an increased risk of aggression. Interventions related to ensuring safe staffing levels were found to be a foundational element of any violence prevention strategy (D'Ettorre et al., 2020).

Environmental and Engineering Controls

Modification of the physical work environment is a critical primary prevention strategy designed to limit opportunities for violence by applying specific design principles. A variety of effective environmental and engineering controls have been examined in several studies. Controlled access

points, including metal detectors, locked doors, and electronic key-card systems in high-risk areas such as emergency departments and psychiatric units, serve to prevent weapons from entering a facility and limit unauthorized movement (Vilke et al., 2023). An optimized layout and visibility are critical; a nursing station designed with lines of sight into patient rooms and common areas, eliminating blind spots, and using open and well-lit spaces can deter potential aggressors while also facilitating surveillance of behavior by staff (MohammadiGorji et al., 2021). Finally, "safe rooms" and clear exit strategies have been identified as an important layer of protection. Assuring that staff have designated, easily accessible rooms to retreat to during a threatening situation, as well as clearly identified unlocked staff exits, provides an important avenue of escape and protection (Ramacciati et al., 2016).

Education and Training Programs

A large amount of the literature reviewed was related to educational interventions, with the main focus being on de-escalation training. Effective de-escalation training programs teach nurses to identify early signs of agitation, utilize verbal and non-verbal communication techniques to defuse tension, and safely manage aggressive behavior without resorting to restraint (Somani et al., 2021). Research by Price et al. (2015) and Heckemann et al. (2016) has shown that this type of training can lead to increased confidence and knowledge for nurses in terms of managing such situations. Evidence on the direct, sustained reduction of physical assault rates is not conclusive; however, with many studies indicating that recurrent, hands-on, scenario-based training is necessary rather than reliance on a single online module.

Other educational initiatives include the development of Code Grey or Code Violet teams that provide specialized, trained teams to assist in violent or escalating situations. Training for these teams, and for general staff on how and when to activate them, is are critical piece of their effectiveness (Wong et al., 2020).

Secondary Prevention: Response and Management of Violent Incidents

Secondary prevention strategies rely on the immediate response to a violent event in order to reduce the harm.

Emergency Response Systems

Rapid response is paramount in violent incidents. In several studies, the use of personal wearable duress alarms was discussed, such as panic buttons and badges with GPS tracking that show the location of a nurse in distress. These can alert security and colleagues to a nurse's whereabouts and need for assistance instantly, reducing the actual times of response considerably (Asiri et al., 2025). This would include how well these systems are integrated into a centralized security console as an important factor in their effectiveness (Griffiths et al., 2024).

Restrictive Interventions

As a last resort, when de-escalation fails and there is an imminent threat of harm, physical or chemical restraint may be necessary. The literature strongly emphasizes that these interventions need to be governed by strict protocols, used as a last resort, and performed by people who are trained to do so to avoid injury to both the patient and the staff (Holloman & Zeller, 2012). More recently, there has been a move toward trauma-informed care and the minimization of seclusion and restraint, given the psychological harm associated with these practices.

Tertiary Prevention: Support and Mitigation after an Event

Tertiary interventions are those provided after a violent incident, primarily to help affected staff and prevent long-term negative consequences.

Post-Incident Reporting and Debriefing

A strong, nonpunitive incident reporting system allows documentation of events, trend analysis, and the development of better prevention strategies. Underreporting, however, is still a big problem, often because of perceptions that it is futile, time-consuming, or may result in blame (Taylor & Rew, 2011). After a serious incident occurs, structured debriefing sessions, such as Critical Incident Stress Debriefing (CISD), can offer a forum for staff to process the event emotionally and to identify lessons learned.

Psychological and Organizational Support

Providing immediate and long-term psychological support is a necessary ethical responsibility of healthcare employers. The availability of EAPs, counseling services, and administrative leave with pay subsequent to a violent incident is crucial in fostering recovery and mitigating the occurrence of PTSD and burnout (Wang et al., 2022). A supportive management and peer response post-incident was repeatedly identified as one of the most significant factors in a nurse recovering and returning to work (Gillespie et al., 2025).

Synthesis of Effectiveness and Key Challenges

Synthesizing the evidence, there is a clear indication that the effectiveness of any given intervention is inherently limited, with workplace violence being a multifaceted problem that cannot be alleviated through a single measure. The most successful and sustained reductions in violent incidents were reported without fail across studies implementing a bundled or systems approach, wherein elements from all three tiers of prevention were combined in a strategic manner (Marquez et al., 2020; Xu et al., 2020). For example, a truly complete program would incorporate foundational elements, such as environmental redesign, with responsive capabilities like de-escalation training and panic button systems, ranging into both primary and secondary prevention, and would culminate in a robust post-incident support program to mitigate long-term harm through tertiary prevention. Yet, these integrated

programs face significant challenges in their implementation and in ensuring success.

Major barriers cited throughout the literature include inconsistent training, where an absence of regular, realistic, and mandatory teaching for all staff erodes competence; a pervasive acceptance culturally of violence as an unavoidable "part of the job," which fosters underreporting and complacency; chronic resource limitations, emanating into gross underfunding for security infrastructure, modern technology, and, most critically, sufficient staffing levels; and a general lack of visible management support, manifested as inconsistent policy enforcement and failure of leadership to champion a culture of safety. Often, these mutually interacting challenges create a self-perpetuating cycle in which poorly resourced programs contribute to poor outcomes, which in turn cement the belief that violence constitutes an intractable problem. The key security measures are summarized in Table 1 & Figure 1 below, while the major barriers and facilitators to these measures are summarized in Table 2 & Figure 2.

Figure 1: Categorization and Summary of Key Security Measures

Table 1: Categorization and Summary of Key Security Measures

Category of Intervention	Specific Examples	Reported Effectiveness & Key Findings	Key Citations
Primary Prevention			
Administrative	Zero-Tolerance Policies, WVPPs, Safe Staffing	Effective when fully supported by leadership and combined with other measures. Safe staffing is a foundational element.	Marquez et al. (2020); Speroni et al. (2022); Bae (2024)
Environmental	Panic Buttons, Access Control, Optimized Layout	Highly effective in reducing weapon ingress and improving staff feelings of safety. Requires upfront investment.	Vilke et al. (2023); MohammadiGorji et al. (2021); Ramacciati et al. (2016)
Educational	De-escalation Training, Code Team Training	Increases staff confidence and knowledge. Direct impact on assault rates requires high-quality, recurrent training.	Somani et al. (2021); Price et al. (2015); Kynoch et al. (2011)
Secondary Prevention			
Response Systems	Wearable Duress Alarms, Emergency Response Teams	Reduces security response time. Effectiveness depends on system reliability and staff compliance.	Asiri et al. (2025); Griffiths et al. (2024); Wong et al. (2020)
Restrictive Measures	Physical/Chemical Restraint, Seclusion	Necessary last resort but associated with risk of injury. Trend towards minimization and trauma-informed approaches.	Holloman & Zeller (2012); Muskett (2014)
Tertiary Prevention			
Post-Event Support	Incident Reporting, Critical Incident Debriefing	Underutilized due to cultural and procedural barriers. Debriefing is crucial for psychological recovery.	Taylor & Rew (2011); Elhart et al. (2019)
Psychological Care	Employee Assistance Programs (EAPs), Counseling	Vital for mitigating PTSD, anxiety, and burnout. Management support is a critical facilitator.	Wang et al. (2022); Gillespie et al. (2025)

Table 2: Identified barriers and facilitators to successful implementation

Domain	Barriers	Facilitators
Organizational Culture	Acceptance of violence as "normal"; Blame culture after incidents; Lack of leadership visibility.	Strong, visible commitment from leadership; "Just culture" that focuses on system improvement; Celebration of safety successes.
Resources & Infrastructure	Budget constraints for security tech, Inadequate staffing levels, and Outdated physical infrastructure.	Dedicated funding for safety initiatives; Investment in modern security systems and environmental redesign; Safe staffing models.
Training & Competence	One-time, "check-box" training; Lack of realistic simulation; High staff turnover disrupting training continuity.	Regular, mandatory, hands-on training; Scenario-based drills for Code teams; Integrating training into onboarding for all new staff.
Process & Procedure	Cumbersome incident reporting systems; Lack of feedback after reporting; Unclear protocols for emergency response.	Streamlined, user-friendly reporting systems; Transparent feedback on reported incidents and trends; Clear, practiced emergency protocols.

Figure 2: Identified barriers and facilitators to successful implementation

Discussion

This review summarizes a decade of evidence and reaffirms that violence in nursing environments is a complex, multi-causal problem necessitating an equally complex and integrated solution. The findings emphasize the fact that there is no "silver bullet." The most promising results arise from a systemic bundled approach that integrates administrative commitment, environmental safety, continuous education, rapid response capability, and compassionate post-event care.

A key discussion point is the persistent gap between policy and practice. Many healthcare organizations have WVPPs on paper, but often, nurses' experiences tell another story altogether (Edward et al., 2016). This gap is fed by the barriers identified in Table 2, especially the deeply ingrained cultural acceptance of violence. The culture will not change with memos from leadership; it requires consistent action, resource allocation, and accountability of perpetrators under zero-tolerance policies.

The role of technology is evolving rapidly. While panic buttons and access control are now common, the next frontier includes emerging technologies such as predictive analytics using electronic health record data to flag high-risk patients, and AI video surveillance that detects atypical movement (Martinez et al., 2020). These technologies highlight some key ethical areas of concern in regard to patient privacy and should be implemented with great thought.

The COVID-19 pandemic has presented new challenges and further exacerbated existing ones. For instance, increased volumes of patients, visitor restrictions, and heightened anxiety among the public contribute to increased violence against nurses (McGuire et al., 2022; Beshbishy, 2024). This recent context brings up the need for resilient and adaptable violence prevention strategies that can resist systemic shocks.

Limitations

This review has numerous limitations. Inclusion of only English-language studies and reliance on published literature may introduce selection bias. The heterogeneity of the studies precludes a statistical meta-analysis, which limits the ability to reach definitive conclusions about the magnitude of intervention effects. Further, reliance on self-reported data in many studies can be subject to recall and social desirability bias.

Conclusions and Implications

In conclusion, protecting both nurses and patients from violence goes beyond an organizational imperative to a basic prerequisite for a functional, ethical, and sustainable healthcare system. Evidence synthesized from 2015 through 2024 shows clearly that effective protection requires a multi-tiered

approach systematically woven into the fabric of healthcare delivery. This imperative gives rise to a number of critical implications for practice. First, healthcare organizations should move beyond piecemeal initiatives and implement comprehensive, bundled intervention programs that seamlessly weave together primary, secondary, and tertiary prevention measures. Successful programs rely on leadership that actively champions a culture of safety by working to dismantle the corrosive myth that violence is an inevitable part of the job, while consistently enforcing zero-tolerance policies and fostering a reporting culture where reporting is rewarded and acted upon. In addition, recurrent investment in high-quality, simulation-based training in de-escalation and emergency response for all staff is non-negotiable in establishing core competencies and confidence.

Reframing adequate staffing and resources as a core security measure-one which directly acknowledges the foundational role these play in mitigating violence, rather than an operational or financial issue-is also of utmost importance. Lastly, the establishment of robust, accessible, compassionate support systems forms an ethical duty of care for caregivers in the aftermath of a violent event, aiming at recovery and workforce preservation. To build upon this foundation, future research must address several key areas. Longitudinal studies are urgently needed to determine whether intervention effects can be sustained beyond the immediate post-implementation gains. Economic evaluations are critical to determine the cost-benefit ratio of comprehensive security programs with a financial argument for investment.

Innovation should be explored via the rigorous testing of emerging technologies, including artificial intelligence and predictive analytics, in real-world clinical settings to assess their effectiveness in preventing violence. Finally, the development and validation of standardized outcome measures of workplace violence interventions would significantly advance the field by enabling more informative cross-study comparisons and meta-analyses. The safety of nurses is inseparable from the safety and quality of patient care. By assiduously implementing the evidence-based strategies reviewed here, health care institutions can begin the essential transformation of nursing environments from zones of potential danger into true sanctuaries of healing, safety, and professional practice.

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