Paramedic occupational violence mitigation : A comprehensive systematic review of emergency service worker prevention strategies and experiences for use in prehospital care

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Paramedic occupational violence mitigation: a comprehensive systematic review of emergency service worker prevention strategies and experiences for use in prehospital care.

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Abstract

Introduction: Occupational violence is a significant issue within the context of prehospital health care with the majority of paramedics reporting some form of abuse, intimidation, physical or sexual assault during their career. Though the paramedic literature acknowledges the severity of this issue, there is limited literature examining occupational violence mitigation strategies. Despite this, the operational and environmental similarities that exist between paramedics and other emergency service workers such as the police and firefighters, provide an opportunity to review relatable occupational violence mitigation strategies and experiences. *Methods:* This review utilized Joanna Briggs Institute guidance for systematic reviews of both qualitative evidence and effectiveness. Studies included in this review incorporated those published in English from 1990 through to January 2020. *Results:* Two qualitative studies met the criteria for review. From these, a total of 22 findings were extracted and combined to form four categories from which two syntheses were developed. Twenty-four quantitative studies, encompassing six unique fields, met the criteria for review. *Conclusions:* Mitigation strategies for emergency service worker occupational violence are not easily defined. They are dynamic, multi-layered, and encompass a variety of complex social, medical and psychological influences. In spite of this, there are clear benefits to their application in regard to the approaches and training of violence mitigation. The paramedic environment would benefit from strategies that are flexible to the ongoing needs of the workers and the specific cultural, environmental, and social factors that encompass the paramedic organization.

What this paper adds

What is already known about this subject?

Occupational violence is a significant issue within the context of emergency medical service health care. To help reduce the threat of this violence, occupational violence mitigation strategies aim to equip staff with appropriate knowledge, skills, and equipment. Though there is a significant body of work about the structure, objectives and content of occupational violence mitigation strategies, there is limited supporting evidence to validate the efficacy of such practice. This is reflected in the dearth of peer-reviewed literature on occupational violence mitigation strategies and their effectiveness within paramedic practice. However, the operational and environmental similarities that exist between paramedics and other emergency service workers such as the police and firefighters, provide an opportunity to review relatable occupational violence mitigation strategies and experiences.

What are the new findings?

The qualitative studies provided evidence regarding occupational violence mitigation programs and training, and what emergency service workers perceive is necessary to reduce incidents of violence and aggression. The quantitative studies provided evidence on an array of interventions including conflicting evidence on the use of body-worn cameras and rates of assault; varying rates of effectiveness of chemical sedation and complications amongst different pharmacological agents; decreasing performance of participants self-defense skills under high-pressure situations; perceptions of social cues to imminent violence; and improvements in either training procedures or programs that could influence the way that mitigation strategies are viewed, developed and taught.

How might it impact on clinical practice in the foreseeable future?

Mitigation strategies for emergency service worker occupational violence are not easily defined. They are dynamic, multi-layered, and encompass a variety of complex social, medical and psychological influences. The ability to be adaptable and flexible to the ongoing needs of the workers and their environment, is a keystone to effective occupational violence mitigation strategies. Strategies and systems that are developed for paramedics need to be tailored to the specific cultural, environmental, and social factors that encompass the emergency medical service organization with comprehensive and ongoing evaluation of their impact.

Title

Paramedic occupational violence mitigation: a comprehensive systematic review of emergency service worker prevention strategies and experiences for use in prehospital care.

Introduction

Occupational Violence (OV) can be characterized as any external abuse, threat, or assault of an employee in the context of their work and involves a clear or implied challenge to the employee's personal health, safety, or well-being.[1, 2] OV is a significant issue within the context of Emergency Medical Service (EMS) health care with as many as 90% of paramedics reporting some form of abuse, intimidation, physical or sexual assault during the course of their work.[3-5]

OV mitigation strategies are approaches to education, training and operations that aim to equip staff with the right knowledge, skills, and equipment to help reduce the threat of violence. However, the array of risk factors that predispose paramedics to an increased threat of violence is a challenge for OV mitigation strategies within EMS systems. These risk factors include; working with volatile patients, operating in mobile workplaces, isolation from co-workers, the transportation of patients, and late at night or early morning work hours.[6]

Though there is a significant body of work about the structure, objectives and content of OV mitigation strategies, there is limited supporting evidence to validate the efficacy of such practice.[7] This is reflected in the dearth of peer-reviewed literature on OV mitigation strategies and their effectiveness within paramedic practice.[8] While there exists some literature on OV mitigation strategies for healthcare workers,[7] the majority of these studies are centered on the acute hospital setting.[9] These reviews, though of some interest, are limited in their usefulness due to the emphasis on the hospital environment. By contrast to the hospital setting, paramedics operate in an environment which is dynamic, inconsistent, and with vulnerability exacerbated by the isolation that does not exist within other healthcare professions.[10-12]

The environmental context in which paramedics operate is unique within healthcare and plays a significant role in both defining and dictating decision making processes and social interactions.[13] Though unique to healthcare, paramedics are not alone in operating in such dynamic environments. Paramedics share this space and cooperate in alliance with both police and firefighters under the broader heading of Emergency Service Workers (ESW). ESW work is often physically demanding and punctuated by periods of high-level stress, activity and in locations that are both varied and chaotic. ESW protect public health and safety, at the same time exposing themselves to personal danger through frequent contact with the public during episodes and events of heightened emotions and frustrations.[12] Importantly, like paramedics, all ESW are at an increased risk of exposure to OV during the course of their work.[12, 14-16] While there are important differences between the ESW professions regarding the nature of their work,[12] it is their similarities and distinctive environmental relationship that provides the opportunity to examine the effectiveness of their specific OV mitigation strategies. It is anticipated through a broader examination of the ESW OV literature, effective mitigation strategies can be identified for the purpose of translating this practice or education into the paramedic environment.

Review Question/Objective

The objective of this review was to synthesize the Quantitative (QN) and Qualitative (QL) data regarding OV mitigation strategies and their effects towards ESW. The resulting conclusions and recommendations will prove useful for paramedic occupational safety and training development.

Methods

This multi-method systematic review was undertaken utilizing guidance from the Joanna Briggs Institute (JBI) approach[17] for systematic reviews of both qualitative evidence and effectiveness.

Inclusion/Exclusion Criteria

The review considered any ESW, of any age or gender, who interacts with the public during the context of their work. This included:

- Paramedics, ambulance officers, Emergency Medical Technicians (EMT), and EMS personnel. Paramedic is typically the recognized term for a prehospital emergency healthcare worker, however other terms such as EMT may be utilized.
- Police
- Firefighters and rescuers.

The review excluded any studies that involved working in a controlled environment (e.g. hospital), or those pertaining to aeromedical operations. It also excluded studies which involved the specific use of firearms, conducted electrical weapons (e.g. Taser), and lachrymatory agents (e.g. pepper spray), as these interventions were considered inconsistent with the ethical and professional practice of paramedics.

Type of Interventions

The QN component of this review considered any studies examining strategies delivered to ESW to mitigate occurrences of OV. Interventions included but was not limited to; physical restraint, chemical sedation, behavior management, and audiovisual recording equipment.

Comparators

This review included studies that compared an intervention to other interventions, placebo or control products. The authors placed no limits on the comparator types.

Type of Outcomes

This review considered QN studies that included the following outcome measures:

- Incidence of OV
- Incidence of OV resulting in psychological or physical injury or impairment
- Individual knowledge and skills relating to OV mitigation
- OV mitigation and control measures such as effectiveness of self-defense skills.

Context

The QL component of this review included any studies that explored the perceptions and experiences of ESW on OV mitigation and associated prevention strategies.

Search Strategy

The search strategy aimed to find both published and unpublished studies. An initial limited search of CINAHL and PubMed was undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. The reference list of all studies selected for critical appraisal were also screened for additional studies. The search strategy examined only English language studies published between 1990 and 2020. This extended timeframe was selected to capture the earliest identified paramedic literature on OV.[18] The detailed search strategy for PsycINFO, MEDLINE, ERIC, CINAHL, is listed below, however a complete search strategy can be found in Appendix 1:

< insert Figure 1 here >

Study Selection and Assessment of Methodological Quality

Following the search, all identified citations were collated with titles and abstracts screened and evaluated by two independent reviewers. Studies that met the inclusion criteria were retrieved in full and assessed in detail. Full text studies that did not meet the inclusion criteria were excluded. Studies were critically appraised by two independent reviewers for methodological quality using standardized critical appraisal instruments.[17] Any disagreements that arose between the reviewers were resolved through a discussion and there was no requirement for mediation with a third reviewer. A comprehensive search of the literature revealed a total of 1561 potentially relevant articles including 301 duplicates. Figure 2, by means of a PRISMA[19] flow diagram, outlines the stages of identification and retrieval of studies for inclusion in this systematic review for which there were 26 (24 QN and 2 QL) studies.

< insert Figure 2 here >

QN and QL data were extracted from included papers by the primary reviewer using the standardized data extractions tool available in JBI SUMARI.[17] QL research findings were combined using the JBI SUMARI[17] QL synthesis tool to generate themes and statements from which a comprehensive set of findings were produced. A meta-analysis of QN studies was not possible in this review due to the significant clinical and methodological heterogeneity which existed. Consequently, QN studies were combined into a narrative synthesis for evidence presentation. The primary reviewer analyzed and integrated the results of QL and QN studies, which was then assessed and refined by the remaining reviewers. There were no discrepancies highlighted during this process and therefore no requirement for further mediation.

Results

Characteristics of Included Studies

Two QL studies involving 1178[20] and 10[15] participants respectively, were included for methodological assessment and review. There were 24 QN studies that met inclusion criteria for this review. These studies included 14 (n=6642), examining police OV mitigation strategies,[21-34] and 10 (n= 2306) examining paramedics.[35-44] No studies on either firefighters or rescue professionals were identified.

Results Synthesis of Qualitative Research Findings

The two QL studies investigated paramedics who had been assaulted in the context of their work. A total of 23 findings were extracted from the included studies and assessed for credibility utilizing the JBI levels of credibility and definitions.[45] Each finding was assessed as either *Unequivocal* (accompanied by an absolute explanation), *Equivocal* (accompanied by an indistinct explanation), or *Unsupported* (not supported by the data).[45] Of the 23 findings, 19 (83%) received a finding of Unequivocal (U), and four (17%) a finding of Equivocal (E). No findings of an Unsupported description were recorded. The findings were then placed into four distinct categories before being aggregated into two synthesized findings. A full list of findings are listed in Appendix 2. To assist in the confidence of these synthesized findings, they were then evaluated using the ConQual approach,[45] which provides an appraisal level based on the criteria of dependability, credibility, and the type of research. Based on this methodology the reviewers assigned an overall score of "low" in regard to the level of confidence in both synthesized findings.[45]

Synthesized Finding 1: Organizational, Societal and Judicial Commitment

This finding was derived from the following two categories and their supportive findings and illustrations.

Category 1.1: Law Enforcement and Judicial Mitigation Interventions

EMS OV mitigation strategies cannot function in isolation, they require the support and assistance of ancillary services and systems, including law enforcement, security services, and the judicial system. The following findings describe how paramedics perceive their interactions with these services and systems can affect OV mitigation.

Finding 1: OV definition, intent, and the law (U)[15]
Finding 2: Law enforcement positive (E)[20]
Finding 3: Law enforcement negative (U)[20]
Finding 4: Ineffective hospital security services (U)[20]
Finding 5: Poor judicial support of legal deterrents (U)[15]
Finding 6: Ineffective judicial support (U)[20]
Finding 7: OV Intent and reporting (U)[15]

Category 1.2: EMS OV Mitigation Systems

Just as EMS OV mitigation systems require the support of ancillary services and systems, of equal importance is the support and commitment from within the organization. The following findings illustrate how paramedics perceive organizational support and commitment, and how it affects not only OV mitigation interventions but the attitudes of paramedics towards OV.

Finding 1: Ineffective system wide support (U)[20]
Finding 2: Absence of organizational commitment to OV training (U)[15]
Finding 3: Lack of organizational support to OV systems (U)[15]
Finding 4: Organizational Disconnect (U)[15]

Synthesized finding 2: Occupation Specific OV strategies and Training

This finding was derived from the following two categories and their supportive findings and illustrations.

Category 2.1: OV Mitigation Training

OV mitigation strategies and training need to include an array of knowledge, skills, and awareness to manage the many different types and presentations of violence and aggression. The findings illustrated below establish how paramedics reason their exposure to OV occurred, and subsequently how their OV mitigation training, or lack thereof, failed.

Finding 1: Body Language and Communication Skills (U)[20]
Finding 2: Community expectation (paramedics as heroes) (U)[20]
Finding 3: Identification of problem demographic areas (U)[20]
Finding 4: Inadequate OV training (de-escalation techniques) (E)[20]
Finding 5: Poor or inappropriate OV training (U)[20]
Finding 6: Inadequate OV training (situational awareness) (U)[20]
Finding 7: Inadequate OV training (personal positioning) (U)[20]
Finding 8: Inadequate OV training (lack of recognition) (U)[15]

Category 2.2: OV Equipment Mitigation Interventions

With limited available evidence-based paramedic OV mitigation interventions and strategies, the composition of the specific skills and training forming such programs is often left to the discretion of the EMS provider. The findings listed below describe some of the skills, training and interventions that paramedics believe could or should be implemented by their EMS provider as a way of mitigating incidents of OV.

Finding 1: Physical restraints (U)[20]
Finding 2: Chemical restraints (U)[20]
Finding 3: Protective instruments (deterrents) (E)[20]
Finding 4: Protective instruments (armaments) (E)[20]

Results of Quantitative Findings

A meta-analysis was not possible on the included QN studies due largely in part to their heterogeneity and lack of appropriate data for statistical amalgamation. The 24 QN studies were analyzed against the type of OV strategy and then combined into a narrative synthesis against their measured outcomes. The OV strategies included:

- Body-Worn Cameras (BCW)[32-34]
- Chemical sedation[35-40, 43, 44]
- OV Training approaches[21, 25, 26, 42]
- Body language assessment[22-24]
- Self-defense skills[27-31]
- Physical restraint[41]

The evidence apprising the results of the QN studies was considered to determine a level of confidence for each outcome. This assessment was informed by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.[46] With the exception of BCW which was ranked as 'moderate', all other QN outcomes received a ranking of "very low".

Body-Worn Cameras

Three studies[32-34] examined the use of BWC on the incidence of assaults against police officers by citizens. The intervention of BWC worn by police on the incidence of assault and aggression provided contradictory results. The studies by Ariel et al.[33] and Barela[34] were able to provide evidence that the overall rate of assaults against police decreased during the study period. However the studies by Ariel at al.[32] and Ariel et al.[33] established the probability of a police officer being assaulted whilst wearing a BWC was significantly higher ($p < 0.001$). The results of the Ariel at al.[32] and Ariel et al.[33] studies should be placed within the context of significant heterogeneity between trial locations, with some sites recording a decrease in the rate of assaults.

Chemical Sedation

Eight studies[35-40, 43, 44] examined the effectiveness of chemical interventions for cases of prehospital violence, agitation or behavioral disturbance. The studies examined the pharmacological agents of ketamine,[35-37, 39, 44] midazolam,[38, 40, 44] droperidol[38, 43] and haloperidol[36, 43, 44] for the sedation and control of the violent individual. All pharmacological agents were effective at inducing sedation with ranges between 90%[35] to 96%[39] for ketamine, 86%[38] for midazolam, 90%[43] to 96%[38] for droperidol, and between 65%[36] to 87%[43] for haloperidol. In terms of sedation, ketamine achieved effective sedation considerably faster than the other pharmacological agents at 2 minutes[39] to 5 minutes,[36] when compared to midazolam at 30 minutes,[38] droperidol at 22 minutes[38] and haloperidol at 17 minutes[36].

Complications or adverse outcomes associated with the administration of the pharmacological agent ranged from between 6%[39] to 49%[36] for ketamine, 0%[40] to 23%[38] for midazolam, 3%[43] to 7%[38] for droperidol, and 4%[43] to 5%[36] for haloperidol. Assaults or injuries to paramedics occurred in 15.8%[44] of cases with ketamine sedation, 3%[38] to 6%[40] with midazolam and 4%[38] with droperidol. No information was available for haloperidol sedation. Inadequate information was provided by the authors as to when the injuries occurred i.e. before, during, or after chemical sedation to enable appropriate appraisal.

Self-Defense Skills

Four studies[27-29, 31] examined the ability of ESW to protect themselves from a physical attack, and one study[30] assessed the perceptions of ESW on their preparation and performance of self-defense skills. The studies by Renden et al.[28] and Nieuwenhuys et al.[27] demonstrated that the performance of participants' Arrest and Self-Defense Skills (ASDS) decreased significantly under high-anxiety or high-pressure simulations. The follow-up study by Renden et al.[29] established that increased training was beneficial to ASDS, however performance still deteriorated in high-anxiety conditions. Renden et al.[31] also provided evidence to the benefits of a reflex-based training program incorporating elements of interpersonal skill, as a valid approach to ASDS strategy. Regarding ESW perception of their ASDS, Renden et al.[30] identified that the amount and type of training is an important issue, and that the execution of these skills in an occupational context is generally very different to their application in training.

Body Language Assessment

There were three studies[22-24] examining the role of non-verbal communication in predicting acts of physical violence against ESW. The results from these studies identified remarkably similar perceptions of

social cues to imminent violence. These perceptions were identified from not only Police Officers, some of whom had been exposed to acts of violence, but also in non-law enforcement control groups.

OV Training Approaches

Four studies[21, 25, 26, 42] examined ESW OV mitigation training through concepts of decision making, processing strategies, resource enhancement and specialized training. The studies were each able to demonstrate improvements in either training procedures or programs that could influence the way that EMS organizations view, develop and instruct their OV mitigation strategies. The study by Helsen et al.[21] established the role of high-fidelity training simulations in improving the effectiveness of training interventions. Teller et al.[25] demonstrated the benefits of a specialized training program for management of mental health patients by police and paramedics with improvements noted in both patient compliance and increased transport to mental health facilities. Williot et al.[26] verified the role of emotional processing strategies in the improved detection of threatening cues, and van Erp et al.[42] provided evidence to confirm that enhancing personal resources can result in improvements in attitudes, actions and emotions when dealing with bystander conflict.

Physical Restraint

One study[41] was identified that examined the act of physical restraint by ESW and examined the risks of such practice through the relationship between physical restraint, patient injury, and assaults. Assaults on paramedics occurred in 27% (77/271) of cases, with physical restraint noted to be ineffective 77% (209/271) of the time due primarily to continued resistance of the patient (118/271).

Discussion

Qualitative Findings

The first synthesized finding focused on the characterization of OV, and the contrast of this portrayal when compared to aspects of law enforcement and judicial administration. Though OV is well defined, its application to common law offences is more complex, particularly if the perpetrator is experiencing medical, traumatic, or psychological impairment.[47] Despite the issues with law enforcement and the legal system, the involvement of police is generally seen to have a positive role in the prevention of paramedic OV. Difficulties however, can occur between paramedics and police in their differing objectives in managing patient or offender outcomes. While there can be no single approach to the management of a potentially violent or aggressive patient, the congruence of treatment goals between allied agencies would appear only to benefit OV mitigation strategies.[25]

The other main category of this QL synthesis pertains to the support, communication and commitment from within the organization to EMS OV mitigation systems. These elements of organizational responsibility provide some of the most important characteristics of any OV system and are readily recognized by participants in these systems.[48, 49] The commitment demonstrated by EMS organizations needs to encompass all elements of OV mitigation including robust program evaluation, structured reporting procedures, investigation and support mechanisms for victims, and a system-wide preventative approach including all elements of supervisory, operational, and dispatch practices.

The second synthesized findings demonstrate a perception of inappropriate OV training, skills and interventions. Though individually these findings appear to be related to specific interventions, in reality it is a symptom of a larger scale problem characterized by a lack of course evaluation and a lack of systematic high caliber research.[50, 51] The available literature within health-care identifies that the weaknesses of OV mitigation systems are often the result of a lack of adaptation to the specific needs of the participants and for the environment in which they work.[7, 51] It is also essential that any elements of an OV mitigation system are exposed to a thorough, and on-going evaluation process and evidence of this is extremely limited.[52] The rigorous evaluation of these systems and interventions is a necessity if purposeful, safe, and relevant interventions are to be effective at minimizing the incidence of OV.[7, 50]

Quantitative Findings

The QN component of this review was focused on education or training interventions designed to minimize the incidence or severity of ESW OV.

Body-Worn Cameras

The use of BWC is a relatively new concept for ESW OV mitigation. The theoretical basis for their use centers around the principle that monitoring behavior changes behavior and is underpinned by the social theory of self-awareness.[33] This theory is based on the premise that an individual, knowing with sufficient certainty that their behavior is being observed, will alter various social processes. However, this theory while theoretically sound, is problematic within EMS systems because many patients responsible for OV are affected by drug/alcohol intoxication or have medical illnesses or injuries which reduce their cognitive processing abilities. This is similar in principle to the failure of closed-circuit television systems to prevent law-breaking, where individuals are generally unaware they are being filmed.[32]

Chemical Sedation

The pharmacodynamics of the drugs used in the chemical sedation of violent patients is complex. The evidence from this review suggests that application of droperidol provides one of the most effective and safe means of providing sedation to the combative or agitated individual. However, the average time to sedation of 22 minutes, is over four times as long as the average time to sedation in the ketamine group. This is an area of concern, because the longer that ESW are tasked with restraining the violent patient, the higher the risk of assault and injury. Despite this, the real risk of significant complications associated with ketamine use remains.[36] Ultimately, there may be no single, optimal pharmacological agent for use by paramedics in sedating the violent patient. EMS providers need to undertake a flexible approach to chemical sedation and provide sedation guidelines that reflect the medical requirements of certain patient populations and indeed the resources and environment that these interactions occur.

Self-Defense Skills

The ability to defend and tactically withdraw from a violent encounter is recognized as a strategic component of OV mitigation strategies.[53] One of the problems associated with such a strategy is that it assumes participants will act and behave consistently under certain stressful conditions. Humans though, are not inclined to act homogenously in such situations and responses can range from fight, flight to freeze.[54] There is no certain way to predict how an individual will react in a given situation and reactions are often instantaneous and instinctive, propelled from deep within subconscious brain circuits.[54]

Furthermore, the stress, anxiety and resulting physiological responses such as increased heart rate and breathing, can further inhibit an individual's performance in such situations.[54] Though genetic predisposition and environment can play a role in how an individual will respond in these situations, regulation of these largely automated reactions is possible through both preparation and training.[54]

These findings are significant to paramedics who are taught self-defense skills through their respective EMS organizations. It suggests that it may be beneficial to not only increase the amount of training time that is delivered to their employees, but that training should also encompass higher levels of stress and anxiety to replicate realistic real-life situations.[30] However, the economic and operational restraints of such training is not practical for most EMS organizations. What is more pragmatic to EMS organizations and their workers is training that reflects a generalized lack of self-defense skill and incorporates inherent instinctive reflexes and interpersonal skills as part of any OV mitigation strategy.

Body-Language Assessment

The ability of paramedics to recognize potentially aggressive situations and act before verbal or physical violence occurs, is a critical element of OV mitigation. The results of studies that examined these behaviors, identified remarkably similar perceptions of social cues to imminent violence. The fact that these behaviors were identified regardless of previous exposure to personal violence or specific training, may indicate that reactions to these behaviors are not learned but rather are instinctual. Notwithstanding, it has been reported that the police officers were more sensitive to these behavioral cues,[23] suggesting that training or experience may help to enhance instinctual reactions.

OV Training Approaches

The systems, programs, and techniques contained within these studies provide a diverse approach to OV mitigation. Notably, the study by Teller et al.[25] examined the issue of OV mitigation not from a reactive approach, but rather from a pre-emptive methodology of mental health management. Mental health emergencies are a global health issue and one of the most common factors in paramedic OV.[55] However, despite the frequency of mental health emergencies, many paramedics acknowledge that they lack the appropriate education and skills to provide the necessary care to these patients.[56]

Conversely, the study by van Erp et al.[42] is important as its OV mitigation strategy is based on the premise of conflict resolution through the enhancement of personal and job resources for paramedics. Such resources are very important in OV mitigation strategies because it acknowledges the personal influence of paramedic behavior in the conflict process. One area of personal influence identified by the study[42] was the capacity of an individual to acknowledge another person's outlook and to assess their thoughts and motives accurately. This perspective is extremely important in conflict resolution because not only does it provide insight into the possible behavioral strategies of others but it also decreases the likelihood that individuals will act on their negative emotions.[42]

Physical Restraint

The use of physical restraints by ESW is accompanied by risks not only to the patient, but to the personnel who apply the restraint as well.[41] Such risks in conjunction with the increasing prevalence of chemical sedation, has appeared to of decreased the use of physical restraint by ESW to control the violent

individual. Though the research reports limited effectiveness on the use physical restraint, the true benefits of its use may not lie in isolated practice but rather in combination with pharmacological interventions.[40, 41]

Integration of Qualitative and Quantitative Components

Integration of the QL and QN components of this review is problematic due largely to heterogeneity of the included studies. The QL component of this review focused on the insights of ESW to OV mitigation strategies, whereas the QN component concentrated on specific OV interventions. Nevertheless, it is apparent from the QL and QN assessments that a disconnect exists between existing ESW OV mitigation literature and the perceptions of ESW to suitable OV mitigation strategies.

Limitations of this Review

There are several limitations of this review. Most notably, a meta-analysis was not possible on the QN studies due to the level of methodological heterogeneity that existed. Additionally, the QL review though able to provide pertinent findings into OV mitigation experiences, is affected by the limited number of studies providing strength to these conclusions. While, the reviewers made all efforts to minimize errors, including the assistance of a librarian to guide search criteria, there is the possibility that some research articles were missed during the literature search. Lastly, most studies related to ESW OV mitigation originated in the United States of America. While these studies are invaluable in terms of providing an insight into OV mitigation, this emphasis may limit the generalization of the findings.

Conclusion

As demonstrated by the type, nature, and variety of studies evaluated, the mitigation of ESW OV is not easily characterized. It is often a dynamic, multi-layered process, encompassing not only an array of perpetrators, but complex social, medical and psychological influences. Strategies and systems that are developed need to be tailored to the specific cultural, environmental, and social factors that encompass the EMS organization with comprehensive and ongoing evaluation of their impact. The ability to be adaptable and flexible to the ongoing needs of the workers and their environment, is a keystone to effective OV mitigation practice. Ultimately, regardless of the interventions provided to paramedics to mitigate OV, they need to be supported not only by the organization, but law enforcement, judicial systems, and society alike.

Implications of Practice

The findings of this review can usefully guide and inform paramedic OV mitigation education, training and practice. The QL recommendations are generated from synthesized findings and are based on the ConQual approach[45] and the JBI grades of recommendation.[57] The QN recommendations are provided with a level of confidence based on the GRADE approach to study evaluation,[58] and the JBI grades of recommendation.[57]

< insert Table 1 here >

< insert Table 2 here >

Summary Statement

No funding has been received to undertake this review. All authors associated with this review have contributed to its development, furthermore the authors have no conflicts of interest to report. The data that supports the findings of this review is available at the locations cited in the reference section.

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