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Mitigation of Occupational Violence to Firefighters and EMS Responders

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U.S. Fire Administration

Working for a fire-safe America

Mitigation of Occupational Violence to Firefighters and EMS Responders

Final report

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Abstract

Purpose and aims: Violence is a major occupational challenge confronting the field of Emergency Medical Services (EMS). Firefighters and EMS responders are increasingly called upon to meet community demands for service. As a result, firefighters and EMS responders are often expected to respond to incidents where they can be exposed to violence. Violence against EMS responders has been recognized as an occupational hazard since the early 1970s, and recent incidents are evidence that the problem has not been abated. A review of the literature from academic and industry trade journals shows an increase in attention to the issue over the years. However, there is limited understanding of risk factors and preventive measures. The literature provides insight into the characteristics of violence perpetrators, EMS responder risk factors, and best practices. Much of the available information on these factors is contradictory, or not rooted in evidence-based assessment. The purpose of this report is to document the causes and risk factors of violence and mitigation opportunities to reduce and prevent violence to EMS responders.

Relevance: This literature review provides an assessment of existing literature and publicly available information on the issue of violence against firefighters and EMS responders.

Methods: This literature review was innovative, in that it included both peer-reviewed and industry publications. While special attention was paid to scientific and peer-reviewed literature that provided quantification of the issue, industry publications provided a more intimate glance into the realities facing EMS personnel who are experiencing violence in the line of duty. This method also revealed to us other findings on the topic of violence in EMS, such as the lapse in time between the first industry publication and the first academic publication regarding violence in the prehospital setting — a finding which would have gone undetected had industry publications not been included in this review. This novel approach created a deeper understanding of the issue.

Results: A critical analysis of the literature led to the identification of nine key themes: historical and contextual grounding, evolution of the definition of violence, characteristics of patients/perpetrators of violence, estimates of violence, EMS responder risk factors, psychosocial impact, under-reporting, best practices, and inventory of best practices and intervention opportunities.

Conclusions: Predicting risk factors associated with violence are difficult to confirm due to the contradictory nature of study findings. Variation in study design, lack of a standardized definition of violence, and under-reporting all contribute to the limited understanding of the issue of violence against EMS responders. However, alarming information regarding the psychological impact from experiencing violence was uncovered. The results of this review thus warrant the need for more rigorous scientific research focused on gathering nationally representative data to better describe the issue of violence to EMS providers. Once gaps in the literature have been addressed, targeted interventions can be developed and organizational, educational and policy reform can be implemented to better protect the safety and well-being of the EMS community.

Background

In January 2016, Drexel University was subcontracted by the International Association of Fire Fighters under their contract with the Department of Homeland Security/Federal Emergency Management Agency contract number: HSFE20-15-Q-0053 for the Mitigation of Occupational Violence to Firefighters and EMS Responders.

Objective

The objective of this project was to study causes and mitigation of violence to firefighters and EMS responders. This study examined both technological and operational mitigation of workplace/on-duty incidents of violence and provided examples of current best practices.

Project relevance

The workplace is a known risk factor for violence-related incidents (Occupational Safety and Health Association (OSHA), 2015). Health care professionals experience the highest rate of workplace violence (WPV) compared to all other industries, with the majority of violent injuries committed by their patients (Bureau of Labor Statistics, 2007). Maguire and Smith demonstrated that work-related injuries among EMS responders were three times higher than the national average for all other occupations (Maguire & Smith, 2013). In regards to occupational fatalities, the rate among paramedics is more than twice the national average for all occupations and is comparable to those of police and firefighters at 12.7 per 100,000 workers per year (Maguire, Hunting, Smith, & Levick, 2002). The rate of nonfatal injuries among United States paramedics was 34.6 per 100 full-time workers per year — a rate more than five times higher than the national average for all workers (Maguire, Hunting, Guidotti, & Smith, 2005). In regard to fatal injuries, a retrospective cohort study of nationally registered emergency medical technicians (EMTs) in the U.S. found that 8 percent of fatalities were due to assaults (Maguire & Smith, 2013).

The Centers for Disease Control and Prevention (CDC) and the National Institute for Occupational Safety and Health (NIOSH) define WPV as "violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty" (Jenkins, 1996). In violence-related research in the prehospital setting, WPV can be further categorized as verbal and physical abuse, property damage or theft, sexual harassment, sexual assault, and intimidation (Bigham et al., 2014; Boyle, Koritsas, Coles, & Stanley, 2007; Corbett, Grange, & Thomas, 1998; Koritsas, Coles, Boyle, & Stanley, 2007; Mock, Wrenn, Wright, Eustis, & Slovis, 1998; Pozzi, 1998).

In the U.S., there are approximately 900,000 EMS responders treating a patient base of approximately 22 million on an annual basis (Maguire & Smith, 2013). The EMS system serves as a critical community-based interface for the population entering the health care system, placing responders at risk for experiencing interpersonal violence from their patients (Lucas, 1999). In 2014, approximately 2,600 EMS responders were treated in the Emergency Department (ED) for injuries resulting from WPV (CDC, 2014).

Acts of violence experienced by EMS responders have been described as "struck by patient," "punched in the face by a drunkard," "tackled by a large man," and "assaulted by a combative patient" (Taylor et al., 2016). Formal recognition of the problem is increasing, however, compared to other health care settings, such as hospitals, WPV in the prehospital setting is inadequately described and requires further consideration (Koritsas, Boyle, & Coles, 2009; Koritsas et al., 2007; Kowalenko, Gates, Gillespie, Succop, & Mentzel, 2013; Kowalenko, Walters, Khare, & Compton, 2005).

Incidents of violence in which firefighters and EMS responders have been injured or killed have captured national attention. Since the beginning of this project, numerous acts of violence have been committed against firefighters and EMTs, some of which are outlined below:

- Jan. 5, 2016: **EMT struck by ATV at crash scene,** Youngstown, Ohio, https://www.ems1.com/ems-assaults/articles/46383048-EMT-struck-by-ATV-at-crash-scene/.
- Jan. 12, 2016: **Ambulance hit in Texas rock-throwing incident,** Austin, Texas, https://www.ems1.com/ems-assaults/articles/48999048-Ambulance-hit-in-Texas-rock-throwing-incident/.
- Jan. 20, 2016: **Denver fire chief stabbed near station,** Denver, Colorado, https://www.ems1.com/ems-assaults/articles/51807048-Denver-fire-chief-stabbed-near-station/.
- Jan. 22, 2016: **Ark. firefighter shot, killed on EMS call,** Pulaski County, Arkansas, https://www.ems1.com/ems-assaults/articles/52653048-Ark-firefighter-shot-killed-on-EMS-call/.
- Feb. 5, 2016: **Hepatitis C-infected patient spits blood into EMT's eye,** Arcade, Georgia, https://www.ems1.com/ems-assaults/articles/57355048-Hepatitis-C-infected-patient-spits-blood-into-EMTs-eye/.
- Feb. 9, 2016: **Chicago medics attacked by couple,** Chicago, Illinois, https://www.ems1.com/ems-assaults/articles/58662048-Chicago-medics-attacked-by-couple/.
- Feb. 15, 2016: **Ky. EMS providers assaulted by burglar,** McKinney, Kentucky, https://www.ems1.com/ems-assaults/articles/60919048-Ky-EMS-providers-assaulted-by-burglar/.
- Feb. 28, 2016: **Drunk NJ woman attacked, spit on paramedics,** Parsippany, New Jersey, https://www.ems1.com/ems-assaults/articles/65165048-Drunk-NJ-woman-attacked-spit-on-paramedics/.
- March 30, 2016: **Woman drives car into creek, assaults paramedic,** Sioux Falls, South Dakota, https://www.ems1.com/ems-assaults/articles/76595048-Woman-drives-car-into-creek-assaults-paramedic/.
- April 8, 2016: **Texas man bites, hits paramedic with guitar,** Corpus Christi, Texas, https://www.ems1.com/ems-assaults/articles/79430048-Texas-man-bites-hits-paramedic-with-guitar/.
- April 15, 2016: **Firefighter fatally shot, second wounded in Prince George's,** Baltimore, Maryland, https://www.washingtonpost.com/local/public-safety/three-people-including-two-firefighters-shot-in-prince-georges/2016/04/15/a0f599bc-0369-11e6-9203-7b8670959b88_story.html?utm_term=.ce4090d59c77.
- April 18, 2016: **Man revived with Narcan, grabs EMT's testicles,** Red Lion, Pennsylvania, https://www.ems1.com/ems-assaults/articles/82607048-Man-revived-with-Narcan-grabs-EMTs-testicles/.
- April 21, 2016: **Disoriented man attacks paramedic after car crash,** Seattle, Washington, https://www.ems1.com/ems-assaults/articles/83667048-Disoriented-man-attacks-paramedic-after-car-crash/.
- May 2, 2016: **Intoxicated teen assaults Md. ambulance crew**, Langley Park, Maryland, https://www.ems1.com/ems-assaults/articles/87395048-Intoxicated-teen-assaults-Md-ambulance-crew/.

- May 3, 2016: **Two arrested for assaulting Cal Fire captain, damaging ambulance,** San Jacinto, California, https://www.ems1.com/ems-assaults/articles/87696048-2-arrested-for-assaulting-Cal-Fire-captain-damaging-ambulance/.
- May 9, 2016: **Ohio paramedic assaulted by drunk woman,** Youngstown, Ohio, https://www.ems1.com/ems-assaults/articles/89278048-Ohio-paramedic-assaulted-by-drunk-woman/.
- May 10, 2016: **NY EMT attacked by man in ambulance,** Elmont, New York, https://www.ems1.com/ems-assaults/articles/89644048-NY-EMT-attacked-by-man-in-ambulance/.
- May 17, 2016: **NY police medic punched by patient,** Freeport, New York, https://www.ems1.com/ems-assaults/articles/91518048-NY-police-medic-punched-by-patient/.
- May 26, 2016: **First person: Sexually assaulted, harassed as an EMS explorer,** https://www.ems1.com/ems-assaults/articles/94359048-First-person-Sexually-assaulted-harassed-as-an-EMS-explorer/.
- Sept. 9, 2016: **Paramedic stabbed in the neck while responding to call,** Cleveland, Tennessee, https://www.ems1.com/ems-assaults/articles/124776048-Paramedic-stabbed-in-the-neck-while-responding-to-call/.
- Sept. 9, 2016: **Patient accused of punching, tackling Dallas paramedic,** Dallas, Texas, https://www.ems1.com/ems-assaults/articles/124837048-Patient-accused-of-punching-tackling-Dallas-paramedic/.
- Sept. 16, 2016: **Ohio man convicted for assault on paramedic,** Gallipolic, Ohio, https://www.ems1.com/ems-assaults/articles/126533048-Ohio-man-convicted-for-assault-on-paramedic/.
- Nov. 2, 2016: **Woman restrained after fighting with EMTs, police,** State College, Pennsylvania, https://www.ems1.com/ems-assaults/articles/140469048-Woman-restrained-after-fighting-with-EMTs-police/.
- March 16, 2017: **Man fractures paramedic's rib after assault in ambulance,** Phoenix, New York, https://www.ems1.com/ems-assaults/articles/221773048-Man-fractures-paramedics-rib-after-assault-in-ambulance/.
- March 16, 2017: **EMT run over, killed by man driving stolen ambulance,** New York, New York, http://nypost.com/2017/03/16/1-medic-dead-another-injured-after-man-steals-ambulance-and-slams-into-them/.

Without effective policies and precautions in place to reduce and prevent the occurrence of violence against EMS responders, the issue will continue to persist. The findings presented in this literature review should serve as an indication that further research is needed in order to better identify risk factors for violence, circumstances surrounding violence, and methods to best mitigate violence so that resources can be properly allocated to protect the health, safety and well-being of EMS responders.

Specific project aims

The overarching goal of the project was to gather and analyze data on the incidence of WPV for fire and EMS responders. Special interest was dedicated to learning about violence that resulted in on-duty fatalities or serious injuries from operational incident response or internal WPV.

To accomplish this goal, our research project had the following three aims:

AIM 1: To define the issue of violence experienced by EMS professionals.

AIM 2: To identify the risk factors of violence associated with the EMS profession.

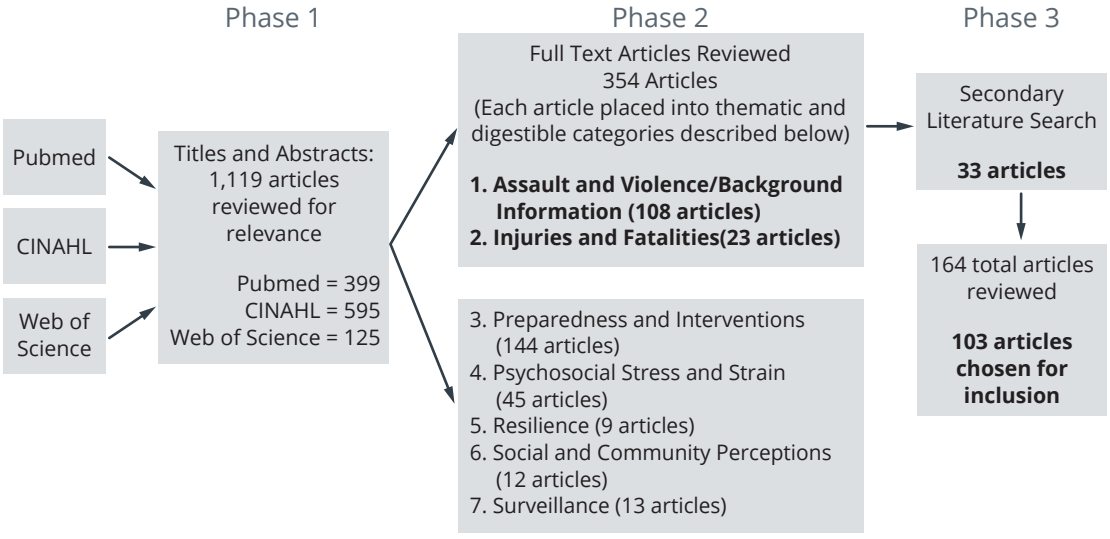
AIM 3: To identify best practices and intervention opportunities.

This literature review addressed a major gap in understanding violence against firefighters and EMS responders. Little is known about the issue of violence against fire and EMS responders. Our literature review contributes added value to the field by including both academic and industry publications, which is an innovative approach to the topic. By including industry publications, there is a more complete and comprehensive representation of the experiences and risk factors associated with exposures to violence in the line of duty. In addition to an analysis of the psychosocial implications that violent exposures have upon personal and organizational outcomes, the literature review incorporates relevant and available literature, as well as the various definitions of violence used in EMS research.

Project methods

This project was comprised of three phases. Phase 1 of the review involved examining each article based on title, abstract and keywords. Phase 2 involved reviewing, assessing and documenting titles and abstracts. Phase 3 involved reviewing, assessing and documenting the full articles of those deemed relevant based on the first two phases. Phase 3 also included manual searches for literature references. A total of 103 full-text articles were assessed and reviewed for in-depth analysis based upon prioritization. Articles retained for analysis are indicated in bold (Figure 1).

Figure 1. Flow diagram results of literature searched and retrieved.



Phase 1: Literature search

Phase 1 of the literature review process consisted of resource collection through three academic databases: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science. The primary accomplishment completed during Phase 1 was the identification, collection and organization of the literature regarding the incidence of violence to firefighters and EMS responders. Three hundred and fifty-four articles were identified for review through a formal literature review.

The literature search strategy included developing a list of EMS specific terminology in regards to: EMS provider level (including firefighters), violence and related terms, and organizational outcomes (Table 1). The asterisk indicated in Table 1 denotes searching for a derivate of the search term. An asterisk can be employed in academic databases to search for a prefix, root or suffix of a key term (e.g., assault* returns literature containing the terms assaults, assaulted, assaulting, assaultive).

Table 1. Literature search terms used to retrieve academic peer-reviewed literature and industry publications through PubMed, CINAHL and Web of Science.

Literature Search Terms			
Paramedic	Assault*	Staffing Models	Occupational Risk
Emergency Medical Technician	Patient Aggression	Risk Assessment	Occupational Injury
*Medic	Healthcare Violence	Intervention	Occupational Hazard
First Responder	Attack*	Scene Safety	Occupational Health
Health Care Worker	Combative Patient	Violence Reduction	Retention
Emergency Medical Services	Patient Initiated Violence	Conflict Resolution	Burnout
Emergency Responder	Fatality	Defensive Tactics	Personal Protection
Pre-Hospital Care	Aggression	Violence Prevention	
Fire Fighter	Workplace Violence	Situational Awareness	
		De-escalation	

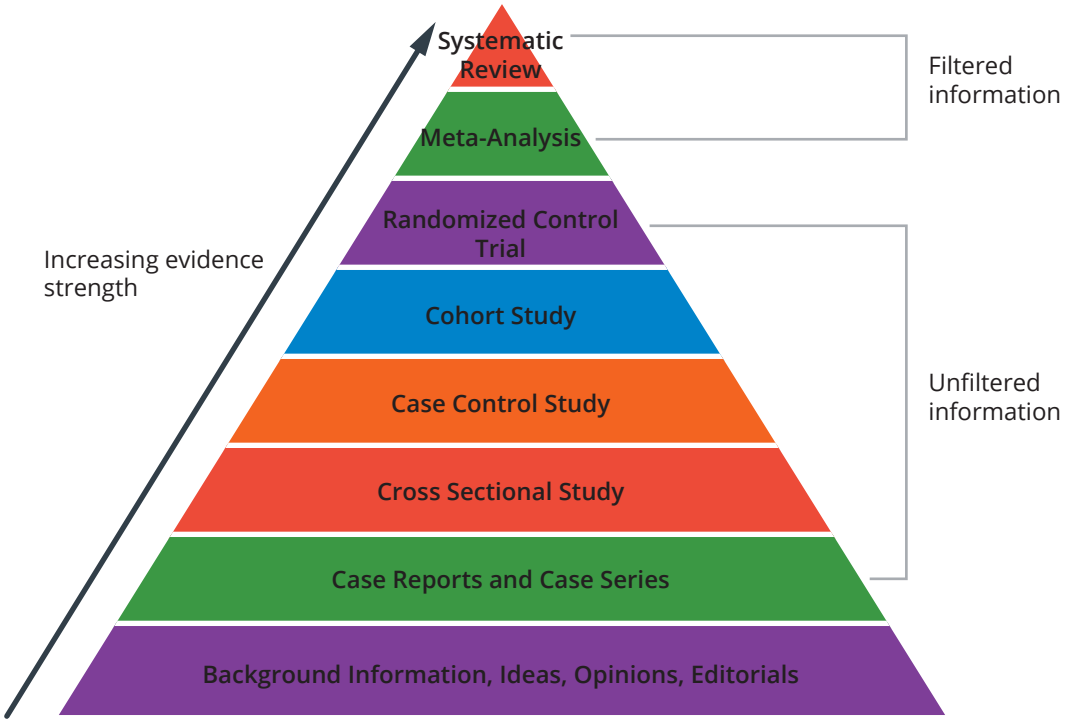
The articles identified in Phase 1 pertain to the incidence of on-duty violence (e.g., patient-initiated violence, patient-on-worker violence, assaults) and the work environment for fire and EMS responders. The articles chosen reflect the comprehensive array of occupational consequences experienced by the fire and EMS workforce, most particularly physical injuries and fatalities, and the psychosocial stress and strain experienced as a result of occupational duties, conditions and exposure to critical incidents.

Phase 2: Appraisal and selection

Phase 2 consisted of reviewing, documenting and synthesizing the information from 131 of the 354 articles. The 131 articles were prioritized by how closely they related to: violence, assault and aggression; the incidence and prevalence of on-duty violence (e.g., patient-initiated violence, patient-on-worker violence, assaults); and injuries and fatalities.

Throughout the literature review process, each article was assessed and scored in order to provide documentation on the quality of the articles' contents. The Evidence Pyramid used in this literature review is adapted from the Medical Research Library of Brooklyn-SUNY Downstate Medical Center and the Cochrane Review (Figure 2). The pyramid provides both a conceptual and visual representation of the quality and amount of evidence available. Systematic reviews hold the greatest academic rigor and are limited in number. In contrast, the bottom of the pyramid demonstrates a decrease in the quality of evidence, yet is more widely available. The levels of the pyramid can be distinguished by two groups: filtered information and unfiltered information. Filtered resources appraise the quality of studies and often make recommendations for practice. Unfiltered resources are comprised of primary resources, which must be checked and verified to ensure that the information is valid and reliable.

Figure 2. Evidence Pyramid used to assess and score literature. Adaptation of the Evidence Pyramid Diagram developed by the Medical Research Library of Brooklyn-SUNY Downstate Medical Center and the Cochrane Review.



Phase 3: Analysis, documentation and writing manuscript

Phase 3 was dedicated to identifying key themes within the literature, documenting the findings, and drafting an initial literature review based on the 131 articles. During Phase 3, an additional 33 articles were identified from a secondary literature review, bringing the new total of articles needing review to 164. This was done in an effort to collect any publications that had been released since the initial literature search. The literature from the secondary literature search followed the same selection processes of the first. During this phase, literature was carefully examined to create the most comprehensive illustration of existing research pertaining to violence faced by firefighters and EMS responders to date.

Criteria for inclusion and exclusion

Inclusion and exclusion factors were decided based upon inter-rater reliability between researchers. To ensure that all literature on the topic was captured in the search, no restriction on publication date was established. All literature relating to the issue of violence in EMS published up until Dec. 31, 2016, was considered. The exclusion process was iterative and based on pragmatic reasoning, elimination of duplicative evidence, and irrelevance to violence experienced by EMS responders. Articles were excluded if they did not discuss violence to EMS providers, they were published in a non-English language, full-text options were unavailable, or they were not set in an emergency department or prehospital environment. Special effort was made to find evaluated studies that would give rise to an evidence-base of effective violence prevention interventions. While academic research allows for enumeration and quantification of violence, industry publications discuss specific knowledge often neglected by scientific literature and provide a rich contextual portal into the realities of EMS work. Therefore, it was determined early on in the literature search that industry-specific publications, such as trade journals, magazines and news features, would be included in this review. Endnote and Endnote Web, a referencing software tool, were used to assist with de-duplication, ease of access, and citation.

From 164 articles, 103 were retained for analysis — 34 were from industrial trade journals and 69 were from academic journals (Appendix A). Of the 69 peer-reviewed articles, 26 articles provided estimates of violence. Of the 26 articles measuring prevalence of violence, only 10 articles defined or described the types of violence being measured (Appendix B).

Literature review key findings

Historical and contextual grounding

Acknowledging the medical, historical and social forces that influenced the establishment of the EMS system in the U.S. is crucial to understanding the experiences and challenges facing EMS responders today.

- The EMS Services Development Act in 1973 favored the decentralization and divestment of power from the federal government to state authorities (Shah, 2006).
- The absence of an overarching EMS authority has created challenges for the structure and functioning of the EMS system; this is best demonstrated by the nonexistence of uniform federal legislation and standards in EMS (Shah, 2006).
- As a result, a centralized data collection surveillance system has never been implemented, which is the cause for the limited availability of EMS data (Shah, 2006).

These deficiencies within the EMS system have tremendously impacted the understanding of issues that are specific to EMS patients, identification of EMS needs, and best practices within EMS (Shah, 2006). Without a comprehensive national data collection system, monitoring occupational exposures and injuries related to occupational hazards, such as violence, is difficult. This situation was also found to be evident in the literature.

Less than a decade after the formal recognition of the EMS system, industry publications mentioning violent patient encounters began to surface. By the 1970s, the issue of violence had been noted as well as documented in the hospital setting; however, the prehospital setting had not yet received similar attention (Lewis, 1978). The year 1978 marks the beginning of a decades-long conversation by the EMS industry in regards to violence experienced in the workplace in which Lewis was the first to note the phenomenon that "aggression begets aggression." Similar sentiments continue to be voiced by emergency medical providers four decades later (Taylor et al., 2016).

From a public health standpoint, EMS serves a crucial role in meeting persistent and emerging community health needs (Studnek, Ferketich, & Crawford, 2007). As a result, EMS responders are often providing patient care in unpredictable and increasingly hostile environments (Miller, 2001).

- Consequently, issues concerning scene safety and personal security are distinct for each patient encounter (Corbett et al., 1998).
- Academic and industry publications have equally postulated the phenomenon that EMS personnel have internalized the belief that violence occurs as a result of it being a "part of the job" (Bigham et al., 2014; Boyle et al., 2007; Erich, 2001; Goldstein, 1991; Kirkwood & Tietsort, 2012; Munding, 2006; Nordberg, 1999; Pozzi, 1998; Suserud, Blomquist, & Johansson, 2002; Yilmaz, Dal, Yaylaci, & Uyanik, 2015).
- There have been attempts by the industry to remedy this belief by stating that the purpose of EMS is to save lives, but not at the expense of their own (Goldstein, 1991). This duality between treating patients versus protecting personal safety has led to an ongoing debate on how to best mitigate and prevent violence in the prehospital setting.

The literature search also revealed the lapse in time between the first industry publication (1978) and the first academic publication (1993) regarding violence against EMS responders (Lewis, 1978; Tintinalli & McCoy, 1993). This example was found to be a meaningful representation of the knowledge gap between researchers and providers, and therefore chose to embark on a novel approach to include both peer-reviewed and academic literature in this review as it creates a deeper understanding of the issue.

The first industry publication on the topic recognized the two settings in which potentially violent situations can occur: the emergency department (ED) and the external environment (e.g., EMS, ambulance staff, and other community-based staff) (Lewis, 1978).

The earliest academic study recognizing violence as a source of injury for EMS responders found that 17 percent of injuries in a small, urban fire system were a result of assault (Hogya & Ellis, 1990). At this point in time, occupational injury profiles of EMTs and paramedics were not well described, and Hogya and Ellis did not define assault, nor did the study include assault in their discussion. Tintinali & McCoy's "Violent Patients and the Prehospital Provider" published in 1993, is the first and seminal scientific investigation that addresses violence against EMS responders. Subsequent literature added estimates describing violence in EMS. Generally, the research that has been conducted in the U.S. uses cross-sectional design with small convenience samples. As such, there are very few studies that employ a rigorous scientific standard and occur longitudinally.

Evolution of the definition of violence

The CDC and NIOSH define WPV as "violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty" (Jenkins, 1996).

The definition of WPV used by the World Health Organization (WHO) includes "incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health" (2002). The WHO definition includes the psychosocial component of violence that is often unrecognized and therefore underestimated. Acknowledging that psychological violence accumulates through repeated exposures is critical to understanding outcomes that EMS responders experience as a result of their work environment (WHO, 2002).

Across selected studies, there was no standardized definition of violence used. Of studies measuring the frequency of violence, 61.5 percent (16 out of 26) did not define or did not differentiate between types of violence (Cheney et al., 2006; Corbett et al., 1998; Grange & Corbett, 2002; Heick, Young, & Peek-Asa, 2009; Hogya & Ellis, 1990; Maguire, O'Meara, Brightwell, O'Neill, & Fitzgerald, 2014; Maguire & Smith, 2013; Mechem, Dickinson, Shofer, & Jaslow, 2002; Pozzi, 1998; Reichard & Jackson, 2010; Schwartz, Benson, & Jacobs, 1993; Thomsen, Sayah, Eckstein, & Hutson, 2000; Tintinalli & McCoy, 1993; Yilmaz et al., 2015). And in some cases, violence was determined after using other proxy terms, such as homicide and injury (Maguire et al., 2005; Maguire et al., 2002).

The first definition of WPV in EMS from industrial literature was in 1984 when Infantino defined "violent client behavior" as a physical activity "destructive to self, others or property" (1984). The definition of violence has evolved to encompass more comprehensive descriptions, which include psychological impacts, such as cumulative stress and burnout. The following terms have appeared most frequently throughout the

literature when describing violent encounters: verbal abuse, property damage or theft, physical abuse, sexual harassment, sexual assault, and intimidation (Boyle et al., 2007; Koritsas et al., 2009; Kowalenko et al., 2013; Kowalenko et al., 2005).

In violence related research, definitions of violence vary and have been operationalized by the researcher (Larsson & Gill, 2013). It is noted that, frequently in EMS literature, no definition of violence is presented. In studies where no definition of violence is predetermined for the survey participants, it may be concluded that the definition of violence may vary significantly from participant to participant (Larsson & Gill, 2013). This is problematic when attempting to describe the prevalence of violence, risks of exposure, and types of violence experienced. The American College of Emergency Physicians has recognized this limitation and has emphasized the importance of categorizing violence against EMS responders (NHTSA, HRSA, EMSC, & ACEP, 2013). In response, the work of Koritas et al. is included, categorizing sources of violence against EMS responders. Koritas et al. defined violence against EMS responders in the following ways:

- **Verbal abuse:** A patient/client, their friend(s), family member(s), other professional(s), or work colleague(s) use offensive language, yell or scream with the intent of offending or frightening you. It can include threats of abuse over the phone, but excludes sexual harassment and sexual assault.
- **Property damage or theft:** A patient/client, their friend(s), family member(s), other professional(s), or work colleague(s) cause damage to, or steal property belonging to you, your family or your workplace. It includes damage to or theft of a vehicle, personal effects, home contents, office equipment and supplies, or office furnishings. Attempted theft of the above items is also included.
- **Intimidation:** A patient/client, their friend(s), family member(s), other professional(s), or work colleague(s) threaten, follow, or use gestures to purposely offend or frighten you.
- **Physical abuse:** A patient/client, their friend(s), family member(s), other professional(s), or work colleague(s) physically attack you, or attempt to attack you. It includes behaviors such as punching, slapping, kicking, or using a weapon or other object with the intent of causing bodily harm.
- **Sexual harassment:** Any form of sexual propositioning or unwelcome sexual attention from a patient/client, their friend(s), family member(s), other professional(s), or work colleague(s). It includes behaviors such as humiliating or offensive jokes and remarks with sexual overtones; suggestive looks or physical gestures; inappropriate gifts or requests for inappropriate physical examinations; pressure for dates; and brushing, touching or grabbing, excluding sexual touching (e.g., the genital or breast area).
- **Sexual assault:** Any forced sexual act, rape or indecent assault perpetrated by a patient/client, their friend(s), family member(s), other professional(s), or work colleague(s). It includes brushing, touching or grabbing of the genitals or breast. It also includes attempted sexual assault (Koritsas et al., 2009).

Variations of these definitions have been used by other researchers in the field (Bigham et al., 2014; Boyle et al., 2007). For this report, the phrase "violence against EMS responders" is deemed to be inclusive of the above violence terms as they relate to EMTs, paramedics, firefighters and first responders. Other terms that have been used to describe the phenomenon of violence against EMS responders in the literature include: patient initiated violence (Taylor et al., 2016) and patient initiated workplace aggression (Oliver, 2015).

There is an important distinction to be made between intentional and unintentional violence (Mechem et al., 2002).

- **Unintentional violence** arises from compromised patients who may be intoxicated and under the influence of drugs or alcohol, have mental health diagnoses, or existing health conditions, such as a diabetic incident, dementia, altered mental status or consciousness, fear, hypoxia, or a closed head injury (Bigham et al., 2014; Rollert, 2007). The industry literature points out that EMS responders often feel that patients in those states who commit violence are a result of survival instinct and not mal-intent (Rollert, 2007).

- **Intentional violence** is premeditated and intended to cause harm, injury or death to other individuals by patients, families or bystanders (Mechem et al., 2002).

Depending on how violence is classified, there may be deep legal implications that affect the patient (or other perpetrators of violence) and the responder. In many cases, the lack of clarity between intentional and unintentional violence and the imperfect legal protections provided to EMS presents challenges for EMS responders seeking justice (Augustine, 2014; Erich, 2001; Taylor et al., 2016; Wirth, 2000). Similar challenges in seeking judiciary justice exist in other health care fields, such as emergency medicine and psychiatry (van Leeuwen & Harte, 2011).

Characteristics of patients/perpetrators of violence

A large body of evidence points to patients as the most common perpetrators of violence (Bigham et al., 2014; Gormley, Crowe, Bentley, & Levine, 2016; Grange & Corbett, 2002; Heick et al., 2009; Infantino, 1984; Maguire et al., 2002; Mock et al., 1998; Petzäll, Tällberg, Lundin, & Suserud, 2011; Pozzi, 1998; Rahmani, Hassankhani, Mills, & Dadashzadeh, 2012; Schwartz et al., 1993; Suserud et al., 2002; Taylor, Davis, Barnes, Lacovara, & Patel, 2015).

- One study involving a convenience sample of all EMS responders in six New England states showed the patient to be the assailant in 84 percent of all violent encounters measured over a six-month period (Schwartz et al., 1993).

- A study investigating injury and fatality data in EMS from a four-year period collected by the U.S. Department of Labor found that the patient was shown to be the cause of injury in 37 percent of all reported injury cases (Maguire & Smith, 2013).

Patients may make threatening postures, use verbal threats, or be agitated (Infantino, 1984). The literature identifies characteristics of violent patients as: age, gender, mental status, substance abuse, and underlying health conditions. However, many findings are contradictory, so there is difficulty predicting when possession of these characteristics will presage violence. No data exist to show which of these characteristics is the most frequent. What is known is described below.

Age

Researchers in Spain found that the most typical profile of a patient committing violence against an EMS responder was a male aged 30 to 50 years, which is consistent with findings from ED studies (Bernaldo-de-Quirós et al., 2014). The elderly were also found to pose a significant risk to EMS responders (Flannery, Walker, & Flannery, 2006; Somes, Donatelli, & Kuhn, 2011).

Gender

Males have been reported as the most frequent perpetrators of violence (Grange & Corbett, 2002; Petzäll et al., 2011; Bernaldo-de-Quirós et al., 2014). However, a separate study found female patients of the mean age of 32.5 years +/- 8.1 years to be the most frequent perpetrators (Cheney et al., 2006; Mock et al., 1998).

Mental status, substance abuse, underlying health conditions

Some study findings suggest that patients committing violence in EDs were more likely to be suffering from an altered mental capacity compared to violent patients committing violence against EMS responders (Bernaldo-de-Quirós et al., 2014). In the Spanish study, a majority (55.2 percent) of violent patients had no known altered mental capacity, and less than half of violent perpetrators had a psychiatric disorder or were under the influence of drugs and alcohol (Bernaldo-de-Quirós et al., 2014). Industry perspectives were uniform that one of the major patient characteristics is intoxication, drugs and mental illness (Erich, 2001; Miller, 2001). Several academic studies support this claim (Bigham et al., 2014; Cheney et al., 2006; Mock et al., 1998; Petzäll et al., 2011; Suserud et al., 2002). Other research suggests that any condition that causes an altered mental status or consciousness, such as trauma and diabetes, may lead to patients committing violent acts (Bigham et al., 2014; Cheney et al., 2006; Erich, 2001; Mechem et al., 2002; Miller, 2001; Petzäll et al., 2011; Rollert, 2007; Somes et al., 2011). For instance, in a retrospective review of ambulance call reports from a six-month study period, insulin dependent diabetics experiencing hypoglycemic episodes were the cause of 9 percent of violent incidents (Tintinalli & McCoy, 1993).

Bystanders

Research indicates that patients are not the only assailants of violence against EMS responders. Violence has also been documented as being initiated by nonpatients, such as family members and bystanders (Gormley et al., 2016; Lucas, 1999; Mechem et al., 2002; Mock et al., 1998; Petzäll et al., 2011; Pozzi, 1998; Rahmani et al., 2012; Suserud et al., 2002). In a prospective, observational case-series study of 297 EMS runs conducted over 737 hours of observation, the violent person was not the patient in one-third (5 out of 16) of violent calls (Mock et al., 1998). Furthermore, one study found that verbal abuse in the form of intimidation occurred most frequently from colleagues, such as partners, managers, police officers, nurses, and physicians (Bigham et al., 2014). Colleagues were also frequent perpetrators of sexual harassment and sexual assault (Bigham et al., 2014).

Weapon possession

Weapons were present in less than 12 percent of violence related cases throughout the majority of the select studies measuring weapon possession (Mock et al., 1998; Pozzi, 1998; Tintinalli & McCoy, 1993). Although these studies suggest a relatively low incidence of weapons possessed by violent or combative patients, research shows that many EMS responders may not be equipped to deal with the issue. In a study of EMS responders from Boston and Los Angeles metropolitan areas, 42 percent of respondents indicated that they did not regularly search their patients for weapons (Thomsen et al., 2000). Yet, as many as 79 percent of respondents in another study reported having seen or found a weapon on a patient (Corbett et al., 1998). Tintinalli makes the observation that EMS responders experience increased susceptibility because almost anything in the ambulance can be used as a weapon (Tintinalli & McCoy, 1993). This lack of clarity in existing literature describing who the perpetrators of violence are, how violence plays out, and the circumstances surrounding violence signals the need for future scientific inquiry.

Other potential factors affecting the tendency for violent patient behaviors include:

- Dissatisfaction with promptness of ambulance arrival.
- Lack of understanding of treatment and care needs (often coupled with ignorance of illness and their symptoms).
- Frustration and/or anger from feeling helpless in a time of emergency.
- Wishes to refuse transport.
- Culture clash.
- Language inadequacies (Behnam, Tillotson, Davis, & Hobbs, 2011; Bernaldo-de-Quirós et al., 2014; Mock et al., 1998; Petzäll et al., 2011).

Estimates of violence

Cross-sectional surveys, direct observations, and injury reports have been the key methods used to quantify the problem of violence against EMS responders. Methodological variations do not permit cross-comparisons between studies for the following reasons: because they do not contain the same population denominator, and intervals of measuring violence vary.

While some studies assess career exposure, some studies compare rates of violence occurring over the last 12 months, three months, or one month. Thus, only the estimates and ranges of violence that exist compared to the population from which they were collected can be described within the appropriate time frame measured.

To date, there have been only four studies conducted in the U.S. that may be considered nationally representative. These four studies used survey data from nationally certified EMS responders participating in the Longitudinal EMT Attributes and Demographics Study (LEADS) (Gormley, 2016; Oliver, 2015; Blau, Chapman, Gibson, & Bentley, 2011; Studnek et al., 2007). These data are the most comprehensive information on demographic characteristics and occupational injuries and exposures in EMS responders. Gormley et al. (2016) notes that, while the National EMS Certification is only required in 46 states, nationally certified EMS responders are found in each state, thereby favoring generalizability to the entire EMS responder population in the U.S.

In studies measuring career prevalence, between 57 and 93 percent of EMS responders reported having experienced an act of verbal and/or physical violence at least once during their career (Bigham et al., 2014; Boyle et al., 2007; Corbett et al., 1998; Koritsas et al., 2007; Petzäll et al., 2011; Pozzi, 1998; Suserud et al., 2002; Thomsen et al., 2000; Tintinalli & McCoy, 1993).

In a 2013 study using data from the LEADS database collected by the National Registry of Emergency Medical Technicians (NREMT), it was found that among the 1,789 respondents, 69 percent experienced at least one form of physical and/or verbal violence in the past 12 months (Gormley et al., 2016). Furthermore, 43.6 percent experienced one or more forms of physical violence over the same study period (Gormley et al., 2016). Non-U.S. studies find similar rates, with one study reporting that 87.5 percent of respondents reported some form of WPV in the last 12 months (Boyle et al., 2007). Similarly, 75 percent of paramedics from two Canadian provinces reported experiencing violence in the past 12 months (Bigham et al., 2014). Suserud et al., conducted a small, mixed-methods study of violence on urban and rural EMS in Swedish responders and found that rates of verbal and physical violence in the last 12 months were 78 percent and 67 percent, respectively (2002). Additionally, Suserud et al., found that 35 percent of survey participants reported

being victimized at least every three months (2002). In another study conducted in New England, the prevalence rate of violence was 20.3/100 full-time employees per year. Additionally, 38 percent of those surveyed in New England reported multiple assaults within the past six months, and one EMT reported being assaulted nine times during that same six-month period (Schwartz et al., 1993). Conversely, crude estimates from a study conducted in Southern California found a much lower frequency of 0.4 assaults per year per prehospital care provider (Corbett et al., 1998).

Overall, the types of violence frequently encountered include verbal abuse, physical assaults and intimidation (Bernaldo-de-Quirós et al., 2014; Bigham et al., 2014; Boyle et al., 2007; Corbett et al., 1998; Mock et al., 1998; Pozzi, 1998).

- Verbal violence is the most prevalent form of occupational violence to which EMS responders are exposed (Bernaldo-de-Quirós et al., 2014; Bigham et al., 2014; Boyle et al., 2007; Gormley et al., 2016; Mock et al., 1998; Pozzi, 1998; Rahmani et al., 2012; Suserud et al., 2002; Thomsen et al., 2000).
- Verbal violence if ever experienced by EMS responders is estimated to be between 21 percent and 82 percent (Boyle et al., 2007; Grange & Corbett, 2002; Mock et al., 1998; Suserud et al., 2002).
- The range of physical violence if ever experienced by EMS responders is estimated between 22.6 percent and 90 percent (Heick et al., 2009; Pozzi, 1998).

Sources of physical violence are varied. The most frequent sources of physical violence are:

- Struck by attempts.
- Punching, slapping or scratching.
- Spitting.
- Biting (Bigham et al., 2014; Cheney et al., 2006; Gormley et al., 2016; Mechem et al., 2002; Pozzi, 1998).

The least frequent types of physical violence experienced by EMS personnel were:

- Stabbing or stabbing attempts.
- Shooting or shooting attempts (Gormley et al., 2016).

Minor injuries from these actions of violence include minor bruises and abrasions, whereas more serious injuries have included contusions, hematomas, sprains and strains, eye injuries, facial injuries, bites, lacerations, dislocations and fractures (Corbett et al., 1998; Mechem et al., 2002; Petzäll et al., 2011).

While the majority of literature focuses on the frequency of violence experienced, others focus upon the volume of violence experienced by EMS responders. A retrospective review of ambulance reports in a metropolitan area revealed an overall rate of violent encounters to be 0.8 percent of the ambulance call reports that were reviewed over a 3.5 year period (Tintinalli & McCoy, 1993). This is in comparison to a prospective, observational case-series report from the Metropolitan Nashville/Davidson County, Tennessee, fire department-based EMS system in which 5 percent of calls during the study period (297 EMS runs over 737 hours of observation) involved a violent situation directed at EMS responders (Mock et al., 1998). In 14 percent of calls in this study, violence was mentioned to have occurred prior to the arrival of EMS responders. Consequently, Mock purports that between 5 percent and nearly 20 percent of sampled EMS calls in the urban EMS system were related

to either physical or verbal violence (Mock et al., 1998). The overall frequency of violence-related EMS incidents directed at EMS responders thus ranged from 0.8 to 5 percent of all dispatched calls (Mock et al., 1998; Tintinalli & McCoy, 1993).

The literature notes a growing concern associated with violence-related injuries (Reichard & Jackson, 2010; Reichard, Marsh, & Moore, 2011). In Australia, an examination of injury reports determined that paramedics had an injury rate of 80 serious cases per 1,000 workers per year. Out of 6,728 injury reports examined over the 10 year study period, 170 cases resulted from violence described as "assaults or bullying" (Maguire et al., 2014). The risk of injury in Australia was found to be comparable to the rates found in the U.S. (Maguire et al., 2014). One survey of 490 EMS responders revealed that 61 percent had been assaulted on the job, with 25 percent sustaining an injury from the assault (Corbett et al., 1998). Additionally, "struck by" injuries (e.g., struck by an object) accounted for 8 percent of injuries, and an average of over 100 assaults per year were reported (Maguire & Smith, 2013). Eight percent of fatalities (five cases) were due to assaults (Maguire & Smith, 2013). One study found that 4 percent of occupational injuries in one urban fire department resulted from assault. Medical attention was sought in 81.8 percent of incidents in which a responder incurred an injury. The percent of injuries classified as intentional violence was 59.1 percent, and 38.6 percent were classified as unintentional (Mechem et al., 2002).

EMS responder risk factors

Much of the literature focuses on the prevalence and frequency of violent acts against EMS responders. Few studies focus on factors that may predict episodes of violence. The literature reveals eight characteristics as potential predisposing risk factors to violence: age of responder, gender of responder, years of experience, type of service (e.g., fire versus EMS-based departments), occupational characteristics (e.g., firefighter, paramedic, EMT, first responder), population served (e.g., urban, suburban, rural environments), shift, and violent call type. The literature provides no clear evidence on which characteristics pose a greater risk for violent patient encounters. What is known is summarized below.

Age

Age was found to be a significant indicator for increased risk of violence in most studies (Bigham et al., 2014; Gormley et al., 2016; Mechem et al., 2002). In a nationally representative sample of EMTs in the U.S., responders who experienced physical violence from a patient were 1.9 years younger than those who did not experience violence in the past 12 months (Gormley et al., 2016). One survey of Canadian paramedics found that with each additional year, medics were less likely to be exposed to violence (Bigham et al., 2014).

Gender

Conflicting evidence was found pertaining to gender as a risk factor. This factor among EMS responders was not studied under more rigorous conditions until Gormley et al. and Oliver et al. used a longitudinal cohort design. While some studies indicated that men are more likely to experience violence (Grange & Corbett, 2002; Mechem et al., 2002; Mock et al., 1998; Schwartz et al., 1993), others yielded results that women are more at risk (Bigham et al., 2014; Cheney et al., 2006). One study concludes that, among nationally registered EMTs, women are at an increased risk for physical violence, while men were found to be at an increased risk for verbal violence (Gormley et al., 2016). Others found

that female gender was a predictor only for cases of sexual assault and sexual harassment (Boyle et al., 2007), and another found women at significantly higher risk in regards to sexual assault, sexual harassment and verbal violence (Koritsas et al., 2009). In contrast, an international Canadian study found that women were more often victims of violence of all types (Bigham et al., 2014). Further confounding are the results from one study that female paramedics were more likely to report episodes of violence compared to their male coworkers (Bigham et al., 2014).

Other research found that gender was not a risk factor for threats or violence (Petzäll et al., 2011; Taylor et al., 2016). In a systematic review of verbal violence in the general workplace, the majority of studies concluded that gender was not a significant risk factor for violence. In studies with significant results, men were more likely to be at risk for violence compared to women (Guay, Goncalves, & Jarvis, 2014). In an ED setting, though females did not experience a higher rate of violence compared to males, they felt significantly more unsafe and at risk of injury from violence than males (Gates et al., 2011).

Years of experience

Some research shows that work experience is not a significant risk factor for encountering violence (Bigham et al., 2014; Petzäll et al., 2011). Other findings contradict this. Gormley et al. found that personnel who had experienced violent patient encounters had more than double the median years of experience in a longitudinal cohort study of nationally registered EMTs (2016). Likewise, Oliver et al. found that EMTs or their partners with more than 10 years of work experience were more likely to experience violence (2015). The latter studies measure cumulative exposure and differ from Bigham and Petzäll due to stronger study design.

Type of service (nonfire based, fire based, volunteer, municipal or commercial)

In New England, providers working for commercial agencies (private, for-profit agencies) were found to experience the highest rate of violence while on the job compared to municipal and volunteer agencies (Schwartz et al., 1993). One study yielded results that agency type was not significantly associated with patient violence, but was associated with violence from patient family member and bystanders, with 911 agencies experiencing more risk compared to other agency types (Gormley et al., 2016).

Occupational characteristics

In Philadelphia, one study analyzed an injury database of all injuries that were reported between January 1996 to December 1998. Of 1,100 injury reports related to violent incidents, 93.2 percent of documented assaults occurred during patient care activities, suggesting that EMS calls versus fire calls pose more risk (Mechem et al., 2002). Only one study showed that professional level was not associated with violence (Petzäll et al., 2011). All other selected research yielded results showing provider level to be significantly associated with increased risk of violent interactions. Robust evidence points to paramedics being at increased risk for violence compared to firefighters (Gormley et al., 2016; Mechem et al., 2002; Taylor et al., 2016). A study of paramedics and firefighters in Philadelphia found that occupation completely mediated the association between gender and WPV (Taylor et al., 2016). Upon further evaluation, Taylor et al. found that the odds of paramedics being assaulted compared to their firefighter counterparts were 14-fold higher, further indicating the association between occupation and WPV exposures (2016). Firefighters may be less likely to be assaulted due to the nature of their calls

typically being in response to a fire and not to a patient scenario (Mechem et al., 2002). Correspondingly, responders who spent more time providing direct patient care were at increased risk for violence (Koritsas et al., 2009). Therefore direct patient contact and in-person communication may be a predisposing factor for why direct patient care results in greater exposures to violence (Koritsas et al., 2009).

Other research focused on the distinctions between EMT provider level as a risk factor for violent exposures. Some studies have found that paramedics are at increased risk for physical violence when compared to EMTs (Gormley et al., 2016; Mechem et al., 2002; Schwartz et al., 1993). In a national cohort study, over twice as many paramedics compared to EMTs experienced physical violence (Gormley et al., 2016). Additionally, paid providers were more likely to be assaulted and were 2.72 times more likely to report an assault compared to volunteers (Heick et al., 2009). Other studies also found volunteers to be at less risk compared to career EMS responders (Gormley et al., 2016).

Population served/Community size

Though there are limited studies assessing population served or community size as a risk factor for violence, available evidence purports that EMS providers working in urban environments have increased odds of experiencing physical violence (Gormley et al., 2016; Suserud et al., 2002). One study found that population served was a predictor only for violence classified as sexual harassment and sexual assault, with urban EMS responders experiencing higher risk (Boyle et al., 2007).

Shift

One study showed that 52.3 percent of violent calls occurred during the night shift (6 p.m. to 8 a.m.), while 47.7 percent occurred during the day. Furthermore, 45.5 percent of violent encounters occurred on a weekend (Friday, Saturday, Sunday) (Mechem et al., 2002). Some studies found that time of day was significantly associated with increased violence exposures. The midnight to 6 a.m. shift was found to have 1.5 greater odds of experiencing a violent patient encounter (Cheney et al., 2006).

Violent call type

Violent call type is an understudied characteristic of the occupation that may be predictive of exposures to violence. One study found that while only 5 percent of calls during the study period (297 EMS runs over 737 hours of observation) involved a violent situation directed at EMS responders, an additional 14 percent of calls in this study were flagged as locations where violence was mentioned to have occurred prior to the arrival of EMS responders (Mock et al., 1998). The 14 percent indicates a potentially hostile environment for responders upon arrival. Consequently, Mock et al. purports that between 5 percent and nearly 20 percent of sampled EMS calls in the urban EMS system were related to either physical or verbal violence (1998). Conversely, violent calls are not always predictable. In an analysis of near-miss and injury events reported to the National Fire Fighter Near-Miss Reporting System, responder narratives revealed that violence may not be anticipated by responders in many cases, as violence can often erupt instantaneously (Taylor et al., 2015).

Psychosocial impact

Violence, or the threat of violence, to EMS responders can have a major impact on the victims and their colleagues (Mechem et al., 2002). While robust evidence of the expected physical outcomes of violence against EMS responders was noted, equally concerning

information was discovered about the psychosocial impact of experiencing violence in this work. There is consensus within the profession that EMS is a stressful occupation (Nordberg, 1992a). The constant threat of physical injury often increases the likelihood that an EMS provider experiences stress (Nordberg, 1992a). Violence exposure in the prehospital setting has been associated with increased levels of stress, fear and anxiety in EMS responders (Gómez-Gutiérrez, Bernaldo-de-Quirós, Piccini, & Cerdeira, 2016). Stress is often a result of exposure to traumatic incidents in the field. Between 82 and 100 percent of EMS responders have experienced a traumatic event (Donnelly & Siebert, 2009). Traumatic events greatly impact the tendency of EMS responders to develop severe mental health conditions. This is represented by the fact that numerous studies place prevalence rates of post-traumatic stress disorder (PTSD) in EMS responders to be greater than 20 percent (Bennett, 2004; Grevin, 1996; Marmar, 1996; Jonsson, 2003; Clohessy, 1999; Newland, Barber, Rose, & Young, 2015).

Some research suggests that social support is significantly related to mental health among EMS responders (Prati & Pietrantoni, 2010). The study conducted by Prati et al., supports the conclusion that social support serves a vital role in regard to resilience, especially following traumatic exposures. There may also be effects on EMS responders' social interactions and personal relationships. Moodiness, including increased anger; withdrawal from social situations, family and friends; increased distrust of people; and apprehension in social settings were also indicated as ways in which responders cope with the effects of violence (Bigham et al., 2014). Divorce and relationship breakups were also reported (Bigham et al., 2014). It has been further suggested that social support may influence first responder's recollection and interpretation of the event and their attribution patterns. Cumulative exposures to stress and traumatic incidents can lead to burnout, which may result in deterioration of quality patient care (Boudreaux, Jones, Mandry, & Brantley, 1996).

Additionally, the presence or absence of a supportive work environment can impact readiness and judgment for each call's special needs. This has been posited to affect a responder's ability to competently deliver high quality patient care and conduct expected job duties. For example, responders may need to respond from one call to another with little to no recovery time due to understaffing or pressures to be in constant service.

Descriptions of the work environment often detail the unpredictability of the job. Literature highlights the exposure to trauma and their mobile workplace (e.g., moving vehicles, difficult terrain, and people's homes) as uncontrollable features of their profession (Maguire et al., 2014).

Stress has not only been categorized by exposure to traumatic incidents, but also the monotonous operational characteristics of EMS organizations, such as paperwork, lack of administrative support, low wages, long hours, irregular shifts, and cynical societal attitudes toward public safety officers (Boudreaux, Mandry, & Brantley, 1997). Cumulative stress associated with the monotonous duties or low acuity calls has led to feelings of desensitization for patients, and their job as a whole (Cannuscio et al., 2016). Concerns have also been raised regarding sleep quality and fatigue and the impact it has not only on the provider, but also job performance and patient outcomes (Patterson, Suffoletto, Kupas, Weaver, & Hostler, 2010). Some research has posited that organizational stress often contributes more to the development of PTSD than traumatic events (Maguen, 2009; Regehr, 2007). Also noteworthy is the notion that paramedics are often the source for a lot of criticisms by society for the decisions they make in determining life or death situations for patients and themselves (Nordberg, 1992a). This can affect EMS providers in many ways and may contribute to the slow decline in provider morale.

Burnout, defined as a "syndrome of emotional exhaustion and cynicism" (Maslach & Jackson, 1981), is one of many organizational outcomes that may arise as a result of violence experienced by EMS responders. Studies of burnout in EMS have been described as lacking (Vettor, 2000). The question of whether or not violence would eventually lead to burnout was first raised in the early 1990s (Nordberg, 1992a). Exposures to violence were noted as a reason many EMTs, especially volunteers, left the profession (Nordberg, 1992a). In an early study from 1998, 7 percent of survey respondents within one urban fire department considered leaving EMS as a direct result of an abusive situation they encountered while on the job (Pozzi, 1998). Knowing how to emotionally cope following a tough incident can help to reduce anxiety and burnout (Hopson, 1997). Mixed methods studies conducted in the U.S. and Sweden found that violent encounters altered the patient-provider relationship (Suserud et al., 2002; Taylor et al., 2016). Yet, some in the industry feel that exposures to violence do not cause stress or negatively impact providers (Erich, 2001). This lack of effect has been attributed to the internalization of the mentality that violence is a part of the job (Erich, 2001). It has been posited that years of experience may be a protective factor that allows more experienced responders to experience less stress and anxiety after violent events (Erich, 2001; Mock, Wrenn, Wright, Eustis, & Slovis, 1999). Another possible explanation for the protective factor is that EMS responders with greater experience may have developed a deeper capacity to cope with violent situations (Mock et al., 1999).

For many EMTs, working in environments where traumatic exposures are frequent can trigger thoughts and emotions that are not easily forgotten. Some responders engage in coping mechanisms, such as detachment, in order to continue carrying out their job duties. Industry journals describe the phenomenon of detachment through descriptions such as "divorcing yourself from personal feelings" (Nordberg, 1992b) and making light of situations through humor (Morrison, 2014). The coping mechanisms just described are often encouraged by others in EMS to help oneself make it through the "toughness of the job" (Nordberg, 1992b). Nordberg cites keeping familial communications open in order to help responders cope with the stress and trauma of the job (1992b). However, coping is not possible for all responders. In many cases, EMS responders express that they felt some level of fear, either due to overt acts of violence or the potential for violence (Mechem et al., 2002). Fear toward patients and potential violent encounters can create feelings of insecurity resulting in reduced quality of care for the patient (Petzäll et al., 2011). Additionally, in response to the fear that they may feel, EMS responders may request police backup more often (Bigham et al., 2014).

Evidence weighing the social and economic costs associated with increased violence and burnout is based mostly upon anecdotal evidence, with no assessments conducted on monetary value. Some suggest that, as violence increases, the need for police backup also increases, thereby increasing response time and delaying potentially critical care to a patient in need (Nordberg, 1992a). Other concerns include altered operations for the private sector of EMS (Nordberg, 1992a). Intent to leave the profession is also a concern. As more EMS responders leave the profession, numerous organizational and patient impacts have been hypothesized, including increased costs for training new EMTs and paramedics, greater numbers of inexperienced paramedics serving at any one point in time, and increased error rates committed by new and inexperienced paramedics (Federiuk, O'Brien, Jui, & Schmidt, 1992; Patterson, Jones, et al., 2010). EMS responders also report seeking a job change away from their ambulance role. In some cases, responders stated they lost interest in fieldwork and tried to get off the road and into desk positions. A few had left full-time positions and were working part time while considering a career change (Bigham et al., 2014).

Reporting/Under-reporting

One of the limitations that is frequently mentioned in both academic and industrial publications is the perception that assaults are inherent to the profession, and reporting violent incidents implies an inability to perform the job competently (Corbett et al., 1998). Such attitudes might lead to significant under-reporting of violence in the field (Pozzi, 1998). One study of 1,500 medical providers in New Mexico found that 56 percent of EMS respondents stated that violence is "just a part of the job" (Feiner, 1995). Although a large percentage believe violence is a part of the job, 40 percent believe that if no one was injured during the incident, there was no need to report (Feiner, 1995). Other studies show higher frequencies, up to 71 percent, believing that violence is a part of their job (Pozzi, 1998). In a Canadian study, 62 percent of participants stated that no actions were taken by most paramedics in response to the violent events (Bigham et al., 2014). In the same study, 61 percent of participants did not report the violence to a superior or authority, and 81 percent did not formally document the occurrence in the patient care report (Bigham et al., 2014). Similarly, one study found that only 31 percent of all violent encounters were properly mentioned in the paramedic narrative (Mock et al., 1998).

Conceptual diagram

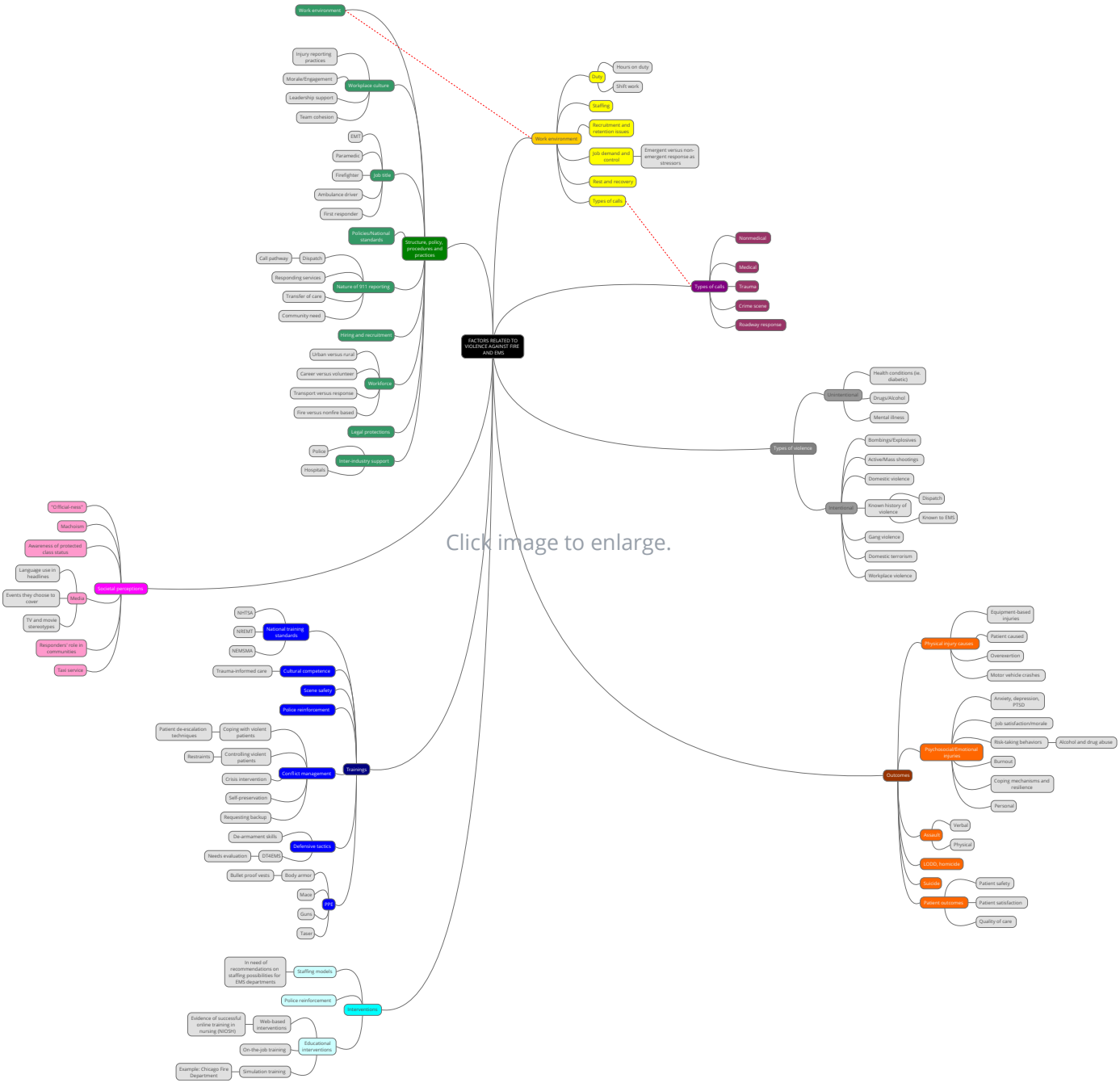
The literature review also contributed to the development of a conceptual diagram (mind map) as a pre-analytic and noncausal depiction of the various aspects of the EMS work environment that relate to violence against EMS responders.

The map offers a concise overview of the broad themes of the work environment that were found to impact the EMS profession. It highlights the various occupational elements that influence EMS responders in the line of duty, as they relate specifically to exposure to violent patients, family and bystanders. Each category and subsequent nodes emanated from the academic peer-reviewed literature and industry publications.

The mind map provides a global look at the complexity and different factors that relate to this work in the EMS industry. The literature pertaining to violence in EMS also offered a myriad of other organizational factors that influence EMS responders at the organizational level and during their day-to-day duties. This map was designed to recognize all of these operational facets of the job.

The mind map diagram (Figure 3) and key follow on the next pages.

Figure 3. Mind map of factors related to violence against fire and EMS.



Click image to enlarge.

Mind map

Domains on the diagram are listed on the following pages. Please refer to the color next to each header to locate its place on the map. Please refer to the key after this list for descriptions of each domain.

Structure, policy, procedures and practices (green)

- Work environment.
- Workplace culture.
  - Injury reporting practices.
  - Morale/Engagement.
  - Leadership support.
  - Team cohesion.
- Job title.
  - EMT.
  - Paramedic.
  - Firefighter.
  - Ambulance driver.
  - First responder.
- Policies/National standards.
- Nature of 911 reporting.
  - Dispatch.
    - Call pathway.
  - Responding services.
  - Transfer of care.
  - Community need.
- Hiring and recruitment.
- Workforce.
  - Urban versus rural.
  - Career versus volunteer.
  - Transport versus response.
    - Fire versus nonfire based.
  - Legal protections.
  - Inter-industry support.
    - Police.
    - Hospitals.

Work environment (yellow)

- Duty.
  - Hours on duty.
  - Shift work.
- Staffing.
- Recruitment and retention issues.
- Job demand and control.
  - Emergent versus nonemergent response as stressors.
- Rest and recovery.
- Types of calls.

Types of calls (purple)

- Nonmedical.
- Medical.
- Trauma.
- Crime scene.
- Roadway response.

Types of violence (gray)

- Unintentional.
  - Health conditions (ie. diabetic).
  - Drugs/Alcohol.
  - Mental illness.
- Intentional.
  - Bombings/Explosives.
  - Active/Mass shootings.
  - Domestic violence.
  - Known history of violence.
    - Dispatch.
    - Known to EMS.
  - Gang violence.
  - Domestic terrorism.
  - Workplace violence.

Outcomes (orange)

- Physical injury causes.
  - Equipment-based injuries.
  - Patient caused.
  - Overexertion.
  - Motor vehicle crashes.
- Psycho-social/Emotional injuries.
  - Anxiety, depression, post-traumatic stress disorder (PTSD).
  - Job satisfaction/morale.
  - Risk-taking behaviors.
    - Alcohol and drug abuse.
  - Burnout.
  - Coping mechanisms and resilience.
  - Personal.
- Assault.
  - Verbal.
  - Physical.
- Line-of-duty death (LODD), homicide.
- Suicide.
- Patient outcomes.
  - Patient safety.
  - Patient satisfaction.
  - Quality of care.

Trainings (blue)

- National training standards
  - National Highway Traffic Safety Administration (NHTSA).
  - NREMT.
  - National Emergency Medical Services Management Association (NEMSMA).
- Cultural competence.
  - Trauma-informed care.
- Scene safety.
- Police reinforcement.

- Conflict management.
  - Coping with violent patients.
    - Patient de-escalation techniques.
  - Controlling violent patients.
    - Restraints.
  - Crisis intervention.
  - Self-preservation.
  - Requesting backup.
- Defensive tactics.
  - De-armament skills.
  - Defensive Tactics 4 Escaping Mitigating Surviving (DT4EMS).
    - Needs evaluation.
- Personal protective equipment.
  - Body armor.
    - Bullet proof vests.
  - Mace.
  - Guns.
  - Taser.

Interventions (aqua)

- Staffing models.
  - In need of recommendations on staffing possibilities for EMS departments.
- Police reinforcement.
- Educational interventions.
  - Web-based interventions.
    - Evidence of successful online training in nursing (NIOSH).
  - On-the-job training.
  - Simulation training.
    - Example: Chicago Fire Department.

Societal perceptions (pink)

- "Official-ness."
- Machoism.
- Awareness of protected class status.
- Media.
  - Language use in headlines.
  - Events they choose to cover.
  - TV and movie stereotypes.
- Responders' role in communities.
- Taxi service.

Mind map key: Factors related to violence against fire and EMS responders

This mind map serves as a visual representation of the factors relevant to the issue of assault and violence toward EMS. EMS includes first responders, firefighters, EMTs and paramedics. The mind map is divided into eight categories: structure, policy, procedures and practices; work environment; types of calls; types of violence; outcomes; trainings; interventions; and societal perceptions. Each category is designed to feature a comprehensive inclusion of factors specific to EMS in relation to violence experienced in the line of duty. Each category and subsequent nodes are evidence-based and rooted in the academic peer-reviewed research and industry publications.

Structure, policy, procedures and practices

This dimension represents the organizational framework and environment in which EMS operates. Organizational climate and work environment are important aspects of any occupation. Support and encouragement at the organizational level can greatly influence the engagement of an individual in one's work. Research illuminates that the level of support responders are receiving may vary depending on their department's work environment and leadership. Support networks outside of EMS are also valuable in the form of interorganizational cooperation with industries, such as police who provide reinforcement and hospitals that help provide quality transitions of patient care. A high level of cooperation, coordination, respect and support at an organizational level sets the stage for responders to be able to do their job safely, professionally and enthusiastically.

Work environment

This dimension represents the elements of the EMS work environment that impact the ability of responders to effectively meet community needs. EMS is a high-stress, high-risk profession, and the demands of the job may leave responders with little opportunity to recover from these occupational demands. Responders are working in a mobile environment that is constantly shifting based on the nature and location of calls. Responders experience stress from emergent and nonemergent calls. Nonemergent calls can leave responders feeling that their service is abused and their time is not valuable. For responders, a positive work environment can significantly impact engagement, job satisfaction, morale and empathy for the patient and communities to whom they are responding. A negative work environment can poorly impact a responder's health and their ability to provide quality patient care in a professional manner.

Types of calls

This dimension represents the types of calls from the community. Nonmedical, medical, trauma, crime scene, and roadway responses come with their own unique stressors. For example, medical calls bear the risk of communicable disease transmission, and roadway responses place responders in hazardous settings exposing them to many risks, such as being hit by inattentive drivers. This dimension is related to work environment in that the presence or absence of a supportive work environment can impact readiness and judgment for each call's special needs. This has been posited to affect a responder's ability to competently deliver high quality patient care and conduct expected job duties. For example, responders may need to respond from one call to another with little to no recovery time due to understaffing or pressures to be in constant service.

Types of violence

This dimension represents the types of violence known to be happening based on existing literature. Violence toward EMS providers takes on two forms: unintentional and intentional. Unintentional violence arises from compromised patients who may be under the influence, have mental health issues, or existing health conditions that result in aggressive behaviors and actions. Intentional violence is patient-caused violence that is premeditated and was intended to cause harm, injury or death to other individuals. In some cases, responding personnel and agencies may be aware of the potential for violence. Dispatch is a vital stage of response in terms of monitoring and preparing the appropriate resources for a potentially violent situation. The literature identifies many sources where intentional violence occurs, including overt situations, such as bombings, active shooters, domestic violence, gangs,

WPV, and terrorism, as well as more inconspicuous situations, such as "normal" responses to residences for cardiac events. Each source of violence has a different set of protocols and procedures that responders follow, yet the unpredictable nature of these scenarios often places added danger and pressure upon responders. Responders may rush into a residence to treat a critical patient and find that they have placed themselves in harm's way by not ensuring proper scene safety and reinforcement. There are ample opportunities to create safer practices and procedures that protect responders against the harms experienced as a result of unintentional and intentional violence.

Outcomes

This dimension encompasses the various outcomes that result from violence encountered on the job. The prevalence of assaults and resulting outcomes are described in a multitude of research studies. Much of the literature is acquired through convenience samples and may not accurately represent estimates. Under-reporting may also be affecting the findings in many of these academic studies. Despite these limitations, the literature does support the conclusion that assaultive patients expose responders to a myriad of injuries that are both physical and psychological in nature, and may also result in LODD and homicide. Psychosocial or emotional injuries are a significant threat to responders' health and well-being. Assault may result in not only physical injuries to the responder, but lingering anxiety, depression and PTSD. Poor work environments and deficient social networks, in combination with anxiety, depression and PTSD, have been known to lead to suicidal ideation, and in some cases, suicide completion. Suffering responders often experience burnout, use poor coping mechanisms, and develop risk-taking behaviors, such as drug and alcohol abuse. These negative outcomes not only affect the responders, but also their interpersonal relationships and demeanor with families, friends and patients.

Training

This dimension characterizes the important role of training in providing safety and protection from violent patients. EMS trainings and initiatives exist from federal agencies, including NIOSH, NHTSA and NEMSMA, that highlight violence as an important factor to consider during training. Yet none of these trainings are standardized and disseminated nationally to all responders. Due to the fact that EMS provides their services through many avenues, such as municipalities, hospitals and third party providers, standardized trainings and comprehensive injury surveillance systems have not been created. Developing a standardized, comprehensive and evidence-backed training program is a crucial element to protecting the health and safety of all responders. The literature highlights the need to develop and sharpen culturally competent and trauma-informed care among responders in order to provide them with the full skill set needed for stressed communities. This includes cross training with law enforcement to develop mutual cooperative practices and defensive training, such as tactical and de-armament skills.

Interventions

This dimension denotes various opportunities for intervention to reduce violence and mitigate its incidence. Staffing models are potentially beneficial interventions yet remain largely unstudied in EMS. Other health care industries have adopted or legislated staffing ratios, but there are no standardized staffing models that EMS can adopt to ensure appropriate community response and proper patient care. Ensuring that adequate resources are in place is the first step in creating a more positive work environment for responders. Increased staffing would allow for greater recovery times

between calls, reduced work hours, and the creation of more amenable shifts. Educational interventions are prevalent in EMS, yet are similarly understudied and underused. Educational interventions can be implemented to increase competencies and confidence in responders' abilities to respond to violent patients. Simulation training is a particularly salient tool and intervention opportunity that allows for hands-on training, which encourages confidence and builds upon practical skill sets.

Societal perceptions

This dimension illustrates the societal views of EMS as perceived by communities. Responders conduct their work in highly visible environments. Responders are typically perceived as the "helpers" in society, and this plays a role in shaping community perceptions. Although EMS is a public service created for those who are in need of help, abuse of the system (in terms of nonemergent calls) contributes to a negative work environment. This contributes to the stress and job dissatisfaction that responders face. Great progress can be made by using social resources, such as the media, to highlight positive facets of EMS. For example, media can help create awareness of a responder's role as an emergency response system and making it known that responders are a protected class. This kind of social support has the potential to significantly reduce pressures and stress on responders in their day-to-day operations.

Best practices

The literature has addressed that there is a problem with violence against EMS providers, but the question remains of how responders entering violent situations should best protect themselves. No evidence or evaluations in the academic literature focus on best practices for mitigating violence. As a result, industry trade publications have proved a vital outlet for the EMS profession to express their firsthand experiences, thoughts and suggestions. Policies and procedures developed by the industry were identified and appropriate for inclusion, due to their relevance and expertise derived from facing the day-to-day challenges of working in high-risk environments.

Within the existing literature, many of the best practices developed by the EMS industry have a focus on trainings, plans, policies and procedures. A compilation of the guidelines suggested throughout the literature can be seen in Table 2. Many of these practices use preventative measures as a tactic to keep EMS providers from entering into a potentially harmful situation. The most common preventative measure is assessing the scene or performing a "windshield survey" in which those arriving at the scene look at past history of the neighborhood and the current situation of the scene they are entering, among other attributes, to decide whether or not it is safe for them to proceed further (Ferrell, 1987; Atkinson, 1993; Goldstein, 1990; Hopson, 1997; Perry, 1995; Nordberg, 1996; Vernon, 2013; Wolfberg & Wirth, 2015). If the scene is deemed unsafe or there is a history of violence, then current procedures recommend requesting police backup, although this is not a guarantee of safety as the police force are a separate entity and follow separate protocols (Ferrell, 1987; Atkinson, 1993; Goldstein, 1990; Hopson, 1997; Perry, 1996; Staten, 1992; Nordberg, 1996; Augustine, 2014; Holliman & Wuerx, 1994). It is very important for the EMS industry to build relationships with those they work amongst, both external and internal organizations, as mentioned in the table, in order to gain a better understanding of how they can work together to provide the best possible outcome for any situation that may arise (Ferrell, 1987; Atkinson, 1993; Goldstein, 1990; Perry, 1996; Staten, 1992; Nordberg, 1996; Augustine, 2014; Holliman & Wuerx, 1994; Hopson, 1997).

Table 2. Emergency medical services best practices to avoid violence.

Partnerships	Build relationships with the local police, fire service, dispatch, schools and community to have a better sense of potential danger.
Appearance	Make sure "EMS" is clearly stated in your appearance, so there is no confusion of your intentions. Be sure to conceal any body armor or items that could be seen or used as a potential weapon by the patient (jewelry, pens, scissors, etc.).
Awareness	Use your senses (sight, hearing, smell, etc.) and acquired street smarts to assess the scene and determine its safety.
	Never take your eyes off of the patient or bystanders. Work as a team with your partner(s) to keep a 360-degree view.
Conciliation	Use compassionate social skills to promote a calm, soothing attitude, and avoid sensitive subjects allowing you to gain trust and cooperation with the patient and/or bystanders. If a patient encounter begins to become unsafe, use these same tactics to calm the situation.
	Negotiate and provide care from a safe position. Avoid close contact with the patient when possible, and avoid providing care in dangerous environments, such as the kitchen, where many objects can be used as weapons.
Police assistance	Request police backup whenever the potential for violence is present. Do not, however, rely on police to ensure your safety. Take measures to ensure the proper steps are taken in securing your safety.
Planning	Plan ahead with your team on all possible entrances, exits and escape routes, and ensure your team is on the same radio frequency during patient care and transport, in case an emergency arises.
Documentation	Record and document detailed narratives of the encounter no matter whether an injury has occurred from the violent encounter or whether the patient experienced an altered mental state — all encounters should be documented.
Priority	Most importantly, remember you are the number one priority, and it is OK to leave a patient to protect your safety.

While the suggested guidelines featured in Table 2 relate to the average EMS call, the literature also addresses trainings for specific situations likely to be associated with violence, such as domestic violence, mass shootings, bombings and the like. This could include gaining assistance and knowledge of how to properly work with hazardous items and substances, such as bombs and explosives, to what questions to ask, and how to prevent escalation in a domestic violence event (Allen, 1996; Schiavone, 1994).

The protocols on handling any of the above situations, while useful, may not always remove the hazard, causing EMS to resort to other strategies. While verbal de-escalation techniques, such as having a calm and nonthreatening demeanor, are the first steps in settling a violent encounter, there are times when more force is needed. It has become commonly accepted for EMS to be trained in self-defense techniques, which can include such practices as martial arts, to be able to restrain the patient when necessary (Rollert, 2007; Perry, 1996). In addition to self-defense techniques, other forms of protection have been proposed and used throughout time.

There has been discussion on introducing weapons, such as guns, Tasers, mace and pepper spray, into the field as additional forms of protection (Nordberg, 1996; Taylor et al., 2016). Many departments believe that if protection is needed, the police will provide it; however, others question what happens when a situation arises quickly and police backup is not readily available (Nordberg, 1996). While these protection methods are to be used as a last resort, there are many differing and controversial views as to whether their implementation is needed, and there are no current standard regulations (Holliman & Wuerx, 1994; Nordberg, 1996). Furthermore, it has been posited that protocols to increase the safety of communities, in addition to training to provide confidence in confronting violent episodes, might supplant the need for EMS personnel to carry weapons for personal protection (Corbett et al., 1998).

One form of protection that is less controversial is the use of body armor. While there are some claims that items such as bulletproof vests provide significant protection from gunshots, blows to the trunk, and knives, many see body armor as uncomfortable and restricting (Holliman & Wuerx, 1994; Benson, 1994). There is also a belief that the visual representation of body armor sends a certain message to the community, which exhibits a non-neutral appearance among EMS, with the potential to encourage shooters to act (Benson, 1994; Atkinson, 1993). Additionally, the authoritative look of EMS responders that often coincide with uniforms of police may contribute to defensive attitudes of patients, families and bystanders (Parlin, 1984). Arguments have been raised that if EMS responders are expected to respond to violent situations, they should be prepared and properly equipped. OSHA's "general duty clause" has been used as evidence that EMS agencies should be providing their responders with proper protective equipment designed to keep them safe in the workplace (Wolfberg & Wirth, 2015).

While there are many measures that can be taken to protect the EMS industry, overall it is stated that there are significant improvements needed in the quantity and quality of trainings offered (Perry, 1996). A lack of training leads individuals to use excessive force or "pick the wrong tool to solve the problem" (Perry, 1996; Kirkwood & Tietsort, 2012). In addition to the recommendations listed in Table 2, Munding offers a list of possible violence mitigation techniques, including training in: scene size up, weapons awareness, weapons management, approaching the scene, approaching a vehicle, entering a structure, conflict management, searching for and confiscation of weapons, self-defense techniques, the legal issues surrounding self-defense, and the use of force and cover and concealment techniques (2006).

Inventory of best practices and intervention opportunities

In fire and EMS, there is an obvious need for training and interventions to prevent and mitigate violence. There is limited evidence regarding the availability and effectiveness of such interventions (Gates et al., 2011). Much of the current violence prevention training that exists consists of generic programs that are not tailored to the unique setting of the patient care provider, and primarily focus on self-defense techniques rather than prevention (Gates et al., 2011). Researchers note the guidelines developed for violence reduction in ED settings do not work well in the EMS industry (Corbett et al., 1998).

In EMS, violence is a topic rarely addressed in clinical training programs, leaving most responders with a hazy "understanding of the phenomenon and few coping strategies" (Infantino, 1984). In one study, as few as 26 percent of respondents reported having ever received formal training in the management of violent encounters (Corbett et al., 1998).

One department studied did not provide any training to their EMS members (Pozzi, 1998). This deficiency in trainings and preparedness was noted in other studies as well (Thomsen et al., 2000; Tintinalli & McCoy, 1993).

While violence may be a topic of instruction for some EMS responders, violence management is often presented in distinctly different formats and learning objectives (Infantino, 1984). Suggested inclusions for an intervention program include topics of: environmental considerations, self-assessment, prevention, verbal intervention (calming/defusing techniques), escape and release procedures, control and restraint procedures, staff anxiety and depression, and post-incident follow-up (Infantino, 1984). Additional suggestions for violence prevention in the prehospital setting include creating specialized training for EMS personnel; creating prevention programs aimed to increase communication skills with patients and/or relatives and bystanders; identifying risk situations and implementing safety measures; and psychological care to professionals who have suffered from WPV (Bernaldo-de-Quirós et al., 2014).

There is limited evidence regarding the availability and effectiveness of interventions designed for preventing and mitigating violence in EMS (Gates et al., 2011). Best practices that have evidence of evaluation are indicated below.

1. In 1998, the U.S. Department of Transportation (USDOT) developed a new paramedic-training curriculum that included expanded topics of abuse, assault and violence. The curriculum is noted to have included learning objectives concerning how to handle victims, diffuse violent situations, and ensure personal safety (Pozzi, 1998). Since authority over EMS initiatives lies within state jurisdiction, individual states can choose not to adopt certain training interventions or curriculums (Pozzi, 1998). There has been no evaluation on the effectiveness of the USDOT violence training objectives.

2. The National Fallen Firefighters Foundation Firefighter Life Safety Initiative 12. There have been calls for development of protocols at the national level in response to violent incidents. Initiative 12 states the need for development and implementation of practices and policies to reduce the likelihood that EMS responders will encounter violence, to standardize response protocols, and to increase survivability for fire and EMS personnel when violent situations are unavoidable (Vernon, 2013).

3. Self-defense for firefighters and EMTs is a training program developed by the Firefighters Support Foundation. This program is available for free through an online download in two formats: a 70 slide PowerPoint program and a 90-minute video program which presents the PowerPoint material and presents hands-on instruction in defensive techniques (http://www.fireengineering.com/articles/2010/06/fsf-self-defense.html). Self-defense for firefighters and EMTs has not been evaluated for effectiveness.

4. In response to the growing issue of violence, some departments have taken it upon themselves to investigate causes of violence and to respond proactively. Departments in Chicago, as well as Wake County, North Carolina, have implemented simulation trainings as a way to monitor and prepare the EMS personnel through life-like scenarios (http://www.naemsp.org/Documents/2017%20Annual%20Meeting%20Handouts/ATMD/NAEMSP.AMD.In.Harm'sWay.01.22.17.pdf#search=violence).

5. The Center for Leadership, Innovation, and Research (CLIR) in EMS has launched the EMS Voluntary Event Notification Tool (E.V.E.N.T.) to assist in data collection of adverse events occurring in EMS. In 2010, CLIR partnered with the National EMS

Management Association and the End Violence Against Paramedics initiative to include violent procedures in their data collection processes which can be used to inform the development of interventions (Hagen, 2013). E.V.E.N.T. is a tool designed to improve the safety, quality and consistent delivery of all EMS by ground, air and water ambulance services operating in all delivery models. It collects data submitted anonymously by EMS practitioners. The data collected will be used to develop policies, procedures and training programs to improve the safe delivery of EMS. A similar system used by airline pilots has led to important airline system improvements based upon pilot reported "near miss" situations and errors. Any individual who encounters or recognizes a situation in which an EMS safety event occurred, or could have occurred, is strongly encouraged to submit a report by completing the appropriate E.V.E.N.T. The confidentiality and anonymity of this reporting tool is designed to encourage EMS practitioners to readily report EMS safety events without fear of repercussion.

6. DT4EMS Violence. The mission of DT4EMS is "to empower cultural and behavioral modification through enforcement of exemplary customer service, reasonability and industry best practices that yield a reduction in employer liability and culminates in an increase of employee safety and security" (www.dt4ems.com). DT4EMS has been in existence for 20 years, and combines the experiences and lessons of police officers, military veterans, lawyers, hospital administrators, risk managers, patient safety officers, hospital security, nurse managers, doctors, firefighters, battalion chiefs, respiratory therapists, corrections officers, former military elite (pararescue jumpers (PJ)/Special Forces(SF)), law enforcement defensive tactics instructors, EMS administrators, dispatchers, nursing supervisors, and EMS supervisors, as well as nurses, paramedics, EMTs and doctors. DT4EMS offers four courses. DT4EMS also offers the Escaping Violent Encounters (EVE) courses which provide training needed to change the safety culture in EMS/fire in the following domains: patient versus attacker recognition, assault response guidelines, proper documentation, principles of cover and concealment, mental preparation for the violent encounter, physical and emotional stress and their effects on the human body during a violent encounter. DT4EMS and the EVE4EMS/Fire courses have not been evaluated for effectiveness.

7. NIOSH webinar, "Workplace Violence Prevention for Nurses" (https://www.cdc.gov/niosh/topics/violence/training_nurses.html). "This free, interactive course is designed to help healthcare workers better understand the scope and nature of violence in the workplace. Upon successful completion of the course, healthcare professionals can earn continuing education units (CEUs). Course modules include: Definition, types, and prevalence, WPV consequences, Risk factors for type II and III violence, Prevention strategies for organizations, Prevention strategies for nurses, Post event response." An evaluation of the webinar found the following:

   > To meet the primary objective of evaluating the effectiveness of this course with a nursing student population, a pre-/post-/post-test survey design was employed to assess changes in awareness and knowledge after completing the course. Results from a one-way repeated measures ANOVA indicated that participation in NIOSH's online workplace violence prevention best practices course increased nursing students' awareness of and knowledge about workplace violence. This awareness and knowledge was sustained four weeks after completing the course. Qualitative thematic analysis revealed suggestions for encouraging participation from the focus group discussants, including offering CEUs or requiring training for employment. Participants also commented that messages could be retained

by incorporating knowledge-check questions, focusing on real-life experiences, and providing summary handout sheets. By educating nursing students about workplace violence, nurses will be better equipped to prevent and manage workplace violence once they enter the workforce, which will provide a safer environment for everyone who interacts in health care settings. (https://aphanew.confex.com/apha/143am/webprogram/Paper331816.html)

While NIOSH has not developed an EMS specific intervention, they have several recommendations for fire departments to prevent and mitigate violence at both the organizational and employee levels (https://www.cdc.gov/niosh/docs/2006-144/pdfs/2006-144.pdf).

Table 3. NIOSH recommendations.

1.	Develop standard operating procedures for responding to potentially violent situations.
2.	Develop integrated emergency communication systems that include the ability to directly relay real-time information between the caller, dispatch, and all responding emergency personnel.
3.	Provide body armor or bullet-resistant personal protective equipment; train on, and consistently enforce its use when responding to potentially violent situations.
4.	Ensure all emergency response personnel have the capability for continuous radio contact, and consider providing portable communication equipment that has integrated hands-free capabilities.
5.	Consider requiring emergency dispatch centers to incorporate the ability to archive location, or individual, historical data, and provide pertinent information to responding fire and emergency medical services personnel.
6.	Develop coordinated response guidelines for violent situations, and hold joint training sessions with law enforcement, mutual-aid and emergency response departments.

In 2004, NIOSH released EMS specific recommendations on methods to best mitigate violence following the investigation into the death of a female firefighter who responded to the scene of a civilian shooting (Table 3).

While the recommendations have been released, no formal intervention program has been developed, nor has a formal evaluation of the recommendations been conducted. Furthermore, NIOSH has recommended that employers establish a zero-tolerance policy for all incidents of violence, train workers on recognizing and preventing WPV, investigate all reports of violence, and work with police to identify dangerous neighborhoods where special precautions need to be taken, and provide that information to employees. From the employee's standpoint, NIOSH recommends the following in response to violent workplace incidents: employees should participate in violence prevention training and report all incidents of violence, no matter how minor (NIOSH Fast Facts, 2012). Other recommendations include concurrent dispatching of police in all high-risk situations associated with violence or the potential for violence (e.g., suicide, homicide, domestic violence, intoxication, and psychiatric illness) (Corbett et al., 1998; Mechem et al., 2002).

Summary

From this examination of the literature, insufficient evidence exists in order to properly describe the issue of violence being experienced by EMS responders. The following content areas were identified and are in need of further development:

1. Standardizing the definition of violence used in EMS research.
2. Creating reliable and consistent epidemiological data on violence against EMS responders through data systems development and recurring surveys.
3. Conducting rigorous scientifically-designed studies.
4. Securing funding for scientific research on EMS violence.
5. Identifying and quantifying risk factors of providers, patients and communities, inclusive of stress, trauma and mental health outcomes.
6. Understanding the roles of coping, resilience and social support in EMS.
7. Developing practices, procedures and policies that support EMS responders.
8. Training all responders to recognize and respond to violence on the job.
9. Conducting evaluations of existing trainings to measure their effectiveness.
10. Developing new trainings as needed and evaluating their effectiveness.
11. Conducting economic analyses on the psychosocial impact of violence in EMS.
12. Assessing the impact of EMS on patient care and quality.

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Acronyms

CDC	Centers for Disease Control and Prevention
CEUs	continuing education units
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CLIR	Center for Leadership, Innovation, and Research
DT4EMS	Defensive Tactics 4 Escaping Mitigating Surviving
ED	emergency department
EMS	Emergency Medical Services
EMTs	emergency medical technicians
EVE	Escaping Violent Encounters
E.V.E.N.T.	EMS Voluntary Event Notification Tool
LEADS	Longitudinal EMT Attributes and Demographics Study
LODD	line-of-duty death
NEMSMA	National Emergency Medical Services Management Association
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
NREMT	National Registry of Emergency Medical Technicians
OSHA	Occupational Safety and Health Association
PJ	pararescue jumpers
PTSD	post-traumatic stress disorder
SF	Special Forces
USDOT	U.S. Department of Transportation
WHO	World Health Organization
WPV	workplace violence

Appendices

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