

**Table 4 – Estimates of Violence from the Academic Literature – Murray et al**

Author (Year) Title	Study Origin	Research Question	Weight of Evidence	Response Rate	Definition of Violence	% Verbal Violence Experienced	% Physical Violence Experienced	% Injuries as a Result of Violence	Other Key Findings	Conclusions
<b>Tintinalli &amp; McCoy</b> (1993) Violent Patient and the Prehospital Provider	USA	To estimate the frequency of violence directed toward pre-hospital providers; identify methods for managing violent patients; and identify educational, medical, and legal issues in EMS.	Cross Sectional Study and Descriptive Review	33 out of 4,200 ambulance call reports (0.8%) were determined to be actually or potentially violent.	Not defined. Violence in this study refers to explicit documentation of the words "violent" or "combative" on the call report, or documentation of verbal threats or physical violence. No differentiation between types of violence.	Not described.	Not described.	67% of survey respondents reported sustaining an injury from violence in the year prior.	1. 50% survey respondents reported having protocols for the management of violent patients; 67% had some training in management of violent patients; 25% had training in assessment of scene safety and situational awareness. 2. Law enforcement officers were present in 82% of ambulance call reports pertaining to violent patients. 3. In 12% of the ambulance call reports documenting violence, the patient used a weapon. 4. 53% of respondents have access to protective gear while only 30% carry the gear with them on duty. 5. In 9% of violent encounters, patients were hypoglycemic.	Found 0.8% of ambulance call reports were associated with violent incidents. This is the first study to be published on violent patients in the pre-hospital setting. Further research is needed to estimate the prevalence of violence toward pre-hospital providers and to identify the most cost-effective methods for injury prevention. Authors assume that the risk of violent behavior, threats, and injury to pre-hospital personnel would be of similar magnitude or greater than that reported in studies of ED personnel.
<b>Schwartz, Benson, Jacobs</b> (1993) The Prevalence of Occupational Injuries in EMTs in New England	USA	To characterize the prevalence and morbidity of injuries to EMTs.	Cross Sectional Study	Of the 786 surveys, 56% (439) were returned.	Not defined. The respondent was permitted to use their own interpretation of injury or occurrence.	Not described.	8.4% of EMTs reported being assaulted in the six months prior; 38% of those who had been assaulted had been assaulted multiple times.	26% of injuries were classified as "struck."	1. 84% of assaults reported over a 6-month period occurred at the hands of a patient.	There were noticeably higher rates of stress and assault amongst EMT-Ps, though there was no determination of statistical significance. More research is necessary to identify training, emotional, behavioral, and mechanical factors that could identify and reduce risk of injury to EMS responders.
<b>Corbett, Grange, Thomas</b> (1998) Exposure of Prehospital care providers to violence	USA	To evaluate the experiences of pre-hospital care providers with and preparation for violent encounters while on the job.	Cross Sectional Study	Of the 774 surveys, 67% (522) were returned.	Not defined. As such, it is possible that verbal and physical assault have been grouped together.	Not described.	61% of respondents recounted assault on the job.	25% reported having sustained an injury from assault; 37% of injuries required medical attention.	1. Injuries were described as: minor bruises and abrasions, eye injuries, facial injuries, bites, lacerations, dislocations, fractures, and sprains. 2. 33% reported a department specific protocol for managing violent situations; while only 28% stated ever having received formal training in the management of violence. 3. 95% reported calling the police upon experiencing violence. 4. 79% reported finding or seeing a weapon on the patient. 5. 73% reported using PPE; and 19% reported carrying a weapon while on the job (knife, gun, chemical).	The use of survey data may not accurately define the extent of a problem of violence against EMS responders, as it relies on imprecise recollections of past experiences from a sampling of an entire population. Authors note the need for prospective analysis to validate the findings relating to violence in EMS.

<b>Mock, Wrenn, Wright, Eustis, Slovis</b> (1998) Prospective Field Study of Violence in EMS Calls	USA	To investigate the nature and frequency of violence encountered by EMS providers.	Prospective Case Series	297 EMS runs over 737 hours of observation were documented as violent call types.	Using the Overt Aggression Scale (OAS) four categories of violence were used: Verbal aggression, physical aggression against objects, physical aggression against self, and physical aggressions against other people.	50% of cases involved verbal aggression.	13% of cases involved physical aggression; 38% of cases involved both verbal and physical aggression.	N/A	1. Police were present on the scene before the arrival of EMS personnel in 44% of violent episodes, and after EMS personnel in 19% of violent episodes. Police were never involved in 37% of all violent calls. 2. <1% of violent runs involved the presence of a weapon on the patient. 3. Physical restraints were used in 50% of the violent runs.	5% of calls were violent runs in this EMS system; 14 % of calls were precipitated by the results of violence (i.e., "post-violent" runs). Exposure to violence is under-reported in EMS documentation. Of the 16 ambulance runs that encountered violence, only 5 (31%) were found to mention violent behavior or aggression in the paramedic narrative. EMS systems should institute specific training sessions on the handling of aggressive behavior based in part on the frequency and nature of violence in their system.
<b>Pozzi</b> (1998) Exposure of prehospital providers to violence and abuse	USA	To quantify the current existence of violence towards EMS personnel, as well as violence related policies and appropriate training at EMS agencies.	Cross Sectional Study	Not stated. 331 personnel in the Albuquerque Fire Department responded to the survey.	Not defined. However, "abuse," "assault," and "violent acts" were used to describe EMS responders' experiences with violence.	Respondents reported a mean of 50 encounters per year per person. A total of 16,461 verbal abuses were encountered by the 331 survey respondents in the prior year.	90% (299 of 331) of the EMS personnel who responded stated that an abuse, assault or a violent action had been directed toward them in their career.	Total number of injuries not described; 18% of respondents experienced injuries from abusive situations and did not report them.	1. 71% of respondents felt that they did not have clear protocols about how to handle abusive situations. It was stated that this agency did not provide training to address violent situations. 2. Respondents reported a mean of 0.6 encounters in which a patient pulled a weapon. 3. 71% of respondents reported that abusive situations were considered a part of the job.	No national standards, policies or procedures exist for violent situations involving EMS personnel, and research is minimal. Recognizing, training for, and documenting violent encounters is a critical step towards prevention.
<b>Mechem, Dickinson, Shofer, &amp; Jaslow</b> (2002) Injuries from Assaults on Paramedics and Firefighters in an Urban EMS System	USA	To determine the nature and frequency of injuries resulting from assaults on paramedics and firefighters in a large, urban, fire department-based EMS system.	Retrospective Case Series	4% (44 out of 1,110) submitted injury reports involved assault and were further reviewed.	The injury report reviewed in this study implies that assault is an incident in which one person inflicts harm on another. "Assault" was then further classified as "unintentional" and "intentional" based on the reviewer's interpretation of the injury report.	N/A	59.1% of physical assaults were intentional assaults, and 38.6% were unintentional.	4.0% of the injury report over a three-year period involved assault. The 44 assault incidents resulted in a total of 56 injuries, as seven individuals were harmed during one incident.	1. 81.8% of assault related injuries required medical attention. 2. Injuries sustained from an assault include: 35.7% contusions, 17.9% sprains and strains, 12.5 scratches. 3. Source of injury include: 35.7% punched, 16.7% kicked, and 9.5% struck by an object.	Injuries resulting from assaults were uncommon (4.0%), however most of these injuries were from patient care activities. A disproportionate number of paramedics incurred injury from assault compared to firefighters. Policies and procedures should be developed to minimize violent incidents.
<b>Grange &amp; Corbett</b> (2002) Violence Against Emergency Medical Services Personnel	USA	To determine the prevalence of violence against EMS providers in the pre-hospital setting and to determine associated factors.	Prospective Case Series	4,102 total EMS data forms over a 31-day period were reviewed.	Physical violence was defined as any unwanted physical contact directed towards the provider, including: slapping, hitting, pushing, kicking, or spitting. Verbal violence was defined as abusive language, threats of violence or injury, gestures, etc.	20.7% of patient encounters involved only verbal assault.	48.8% of patient encounters involved physical violence; 30.4% of patient encounters involved both verbal and physical violence.	N/A	1. 8.5% of EMS data forms over a 31-day period documented violence. 2. 90% of violence was committed by the patient.	EMS responders are at substantial risk for encountering violence in the pre-hospital setting. It is recommended that adequate training, protocols, and recognition of high-risk scenarios be implemented to reduce EMS exposure to occupational injuries caused by violence. Reporting of verbal and physical violence should be made routine procedure.
<b>Maguire, Hunting, Smith &amp; Levick</b> (2002) Occupational Fatalities in Emergency Medical Services: A Hidden Crisis	USA	To estimate the occupational fatality rate among EMS personnel in the U.S.	Retrospective Case Series	Used data from 3 independent fatality databases (e.g., CFOI; FARS; and NEMSMS).	Homicides were marked as assault related deaths.	N/A	N/A	11% of fatalities were caused by assaults.	1. In seven out of 10 fatal injuries, the decedent was shot.	Assault is the third leading cause of death in EMS personnel. Their fatality rates exceed that for all workers and is of similar magnitude to that of other emergency public service workers.

<b>Suserud, Blomquist, &amp; Johansson (2002)</b> Experiences and Threats in Swedish Ambulance Service	Sweden	To describe how ambulance personnel perceive, how they are subjected to, and are influenced by threats and violence in their day to day work.	Retrospective Cross Sectional Study	91.60% (66/72).	Violence is defined as verbal threats and unwarranted use of physical strength.	78% experienced verbal threats.	67% of respondents experienced some form of physical violence.	N/A	1. 17% of threats involved weapons.	Threats and violence are a reality in ambulance services; provisions and measures (like extra support and self-defense techniques) must be taken so that the effects on responders as well as patients are mitigated.
<b>Maguire, Hunting, Guidotti, &amp; Smith (2005)</b> Occupational Injuries Among EMS Personnel	USA	To describe the epidemiology of occupational injuries among EMS personnel, calculate injury rates, and compare the findings with those of other occupational groups.	Retrospective Case Series	617 injury and illness case reports from two urban EMS agencies.	DOL data definitions were used.	N/A	N/A	8 injury cases (3%) due to assault resulted in Lost Workdays.		Injury rates among EMS responders was higher than the rate reported by the DOL for any industry in 2000.
<b>Cheney, et al. (2006)</b> Relationship of restraint use, patient injury and assaults on EMS personnel	USA	To establish the relationship between assaults on EMS responders by patients requiring restraints.	Cross Sectional Study	Reports of 271 restrained patients over a 12-month period in an urban setting.	Not defined. Yes or no response to the question "were you physically assaulted by the patient." Assault was chosen as a proxy variable for potential injury.	N/A	27% of cases (restrained patients) involved assaults on EMS responders.	4% of cases resulted in injuries due to violence.	1. Only 1% of cases of assault related injury required medical attention. 2. Significant variables associated with assault against EMS responders included time of day and the female gender.	This is the first study evaluating patient variables that correlate with assaults on EMS providers by the specific population of restrained patients. Significant variables associated with assault on EMS personnel included the time of day, female gender, violent patients, and patients who sustained injury under supervision. Overall, the study shows that the application of physical restraints is a relatively safe procedure for EMS responders.
<b>Boyle, Koritsas, Coles, Stanley (2007)</b> A pilot study of workplace violence toward paramedics	Australia	To identify the percentage of paramedics who had experienced six different forms of workplace violence.	Cross Sectional Study	28%.	Defined six forms of violence: verbal abuse, property damage or theft, intimidation, physical abuse, sexual harassment, sexual assault.	82% of respondents experienced verbal violence; 87.5 % experienced at least one form of violence over a 12-month period.	38% of respondents experienced physical abuse.	N/A	1. 17% of respondents experienced sexual harassment, and 4% experienced sexual assault.	This study is the first of its kind in Australia to investigate paramedics experiences with workplace violence. The findings suggest a need for prospective studies and a need for violence prevention education.
<b>Heick, Young, &amp; Peek-Asa (2009)</b> Occupational Injuries Among EMS Providers in the U.S.	USA	To describe the incidence and characteristics of nonfatal occupational injuries among EMS providers in the U.S. and examine the relationship between employee status and injury.	Cross Sectional Study	34%.	Physical assault was defined as attack or attempted attack with or without a weapon and with or without injury, as well as without regard for perpetrator intent.	N/A	22.6% reported being physically assaulted in the last 12 months.	12.9% of all reported physical assaults led to injury, with an overall assault injury prevalence of 2.9%.	1. Patients are most likely to be the perpetrators of violence against both paid and volunteer EMS providers. 2. Assaultive patients were most commonly reported as under the influence of drugs or alcohol.	This is the first published study that describes a nationally representative assessment of nonfatal occupational injuries in EMS. Physical assault was the most commonly reported event. Paid EMS responders were 2.72 times more likely to report assault than volunteer EMS responders.
<b>Koritsas, Coles, Boyle (2009)</b> Factors associated with workplace violence in paramedics	Australia	To determine predictors of violence for paramedics.	Cross Sectional Study	28%.	Defined six forms of violence: verbal abuse, property damage, intimidation, physical abuse, sexual harassment, and sexual assault.	82.4% of respondents experienced verbal violence, 54.5% intimidation, 16.5% sexual harassment.	37.6% experienced physical abuse; 4.3% sexual assault.	N/A	1. paramedics were more likely to be assaulted compared to EMTs.	Further research is needed to identify risk factors associated with increased violence against EMS responders. Workplace violence education and training is imperative for prevention of violence as well as its management.
<b>Reichard &amp; Jackson (2010)</b> Occupational Injuries Among Emergency Responders	USA	To characterize injuries among EMS responders, firefighters and police.	Case Series	NEISS injury data.	Not defined.	N/A	N/A	5% EMS personnel reported to the ED as a result of assaults and violent acts.		Discusses the overall injury profiles among EMS responders. Findings suggest that a small number of injuries occurring in EMS are related to violence.

<b>Petzäll, Tällberg, Lundin, &amp; Suserud</b> (2011) Threats and violence in the Swedish pre-hospital emergency care	Sweden	To investigate and describe incidents of threats and violence within the Swedish ambulance service.	Cross Sectional Study	79% (134/170).	Describes a threat as a statement in which you tell somebody that you wish to punish or harm them, especially if they do not do what you want. Violence is defined as violent behavior that is intended to hurt or kill another person.	26% experienced threats during the past year.	66% of the ambulance personnel experienced threats and/or violence during their work; 16% faced physical violence during the last year; 42% expressed being subjected to physical violence during the last year.	N/A	1. 21% of assault related injuries resulted in seeking medical attention. 2. Hematoma with swelling and wounds with minor bleeding were the most frequent assault related injuries. 3. 27% of respondents reported being threatened with a weapon.	Threats and violence in the prehospital setting needs to be addressed. EMS needs a support system for responders who are subject to these exposures of workplace violence.
<b>Rahmani, Hassankhani, Mills, Dadashzadeh</b> (2012) Exposure of Iranian EMTs to workplace violence: A cross sectional analysis	Iran	To describe the exposure of Iranian EMTs to workplace violence and to identify the importance of related factors.	Cross Sectional Study	86%.	Any incident or situation where staff members are abused, threatened, or assaulted in situations relating to their work.	71% reported verbal abuse.	74.6% experienced at least one form of workplace violence in the last year; 37.7% reported physical assault.	4% reported serious injury as a result of assault.	1. Injuries resulting from violent incidents was reported by only 4% of participants. 2. 7.8% experienced workplace violence that involved the use of a weapon.	Findings are consistent with other studies that show a high prevalence of workplace violence in EMS. The findings highlight the need for formal training programs and clearer protocols about how to manage workplace violence.
<b>Maguire &amp; Smith</b> (2013) Injuries and Fatalities among Emergency Medical Technicians and Paramedics in the United States	USA	To examine the characteristics of fatal injuries and determine the rates and relative risks of nonfatal injuries among EMTs and paramedics in the U.S.	Retrospective Cohort Study	21,690 injury and illness cases with lost work days and 59 fatality reports between 2003 and 2007.	Not defined.	N/A	N/A	2.4% of injury cases (530 out of 21,690) were due to assault. This represents an average of over 100 assaults per year.	1. 8% (5 out of 59) of fatalities were due to assaults.	The rate of work-related injuries among EMTs is approximately three times higher than the national average. Assaults account for a large number of fatalities. It was found that females and those aged 25 to 34 have a higher risk of work-related injuries. More research is needed on these areas to be conclusive.
<b>Maguire, O'Meara, Brightwell, O'Neill, &amp; Fitzgerald</b> (2014) Occupational injury risk among Australian paramedics: An analysis of national data	Australia	To identify the occupational risks for Australian paramedics.	Retrospective Case Series	2.5% (170/6728) injury reports were related to violence.	Not defined. Refers to violence as "assault or bullying (i.e., harassment)."	N/A	N/A	1% of injuries were due to violence, such as assault or bullying.		Violence and assault occurring in Australian paramedics is comparable to the rates occurring in the United States. This analysis demonstrates that the paramedic profession is one of the most dangerous occupations in Australia.
<b>Bernaldo-de Quiros et al</b> (2014) Physical and verbal aggression encountered by out-of-hospital emergency responders in the autonomous community of Madrid: differences between urgent and emergent care settings	Spain	To determine the frequency and nature of assaults, analyze the differences and situational variables, and propose measures to prevent violent incidents.	Cross Sectional Study	89.50%.	Defines violence as aggression exemplified by: physical violence, threats, or insults or slander.	75.3% experienced threats, 76.2% experienced insults or slander.	34.5% experienced physical aggression.	17.2% were injured by violence; Only 11.2% filed legal injury reports.	1. Grabbing, pushing behaviors by patients were common. 2. Violent patients had an unaltered mental status in 55.2% of cases.	It is advisable to adopt measures of institutional or organizational efforts to improve safety of responders. Additionally, it is crucial to train responders in conflict management.
<b>Bigham et al.</b> (2014) Paramedic Self-Reported Exposure to violence in the EMS workplace, a mixed method cross sectional survey	Canada	To describe violence experienced by paramedics, including types of violence experienced, by whom the violence was perpetrated, actions taken by paramedics, and effects.	Cross Sectional Study	89%.	Describes five forms of violence: verbal assault, intimidation, physical assault, sexual harassment, and sexual assault.	67% reported verbal violence, and 41% reported intimidation.	90% reported experiencing violence during their career; 75% reported experiencing violence in the past 12 months, 26% reported physical assault, 14% reported sexual harassment, and 3% experienced sexual assault.	N/A		The majority of Canadian paramedics surveyed experienced workplace violence. WPV can lead to personal and organizational outcomes, such as burnout and intent to leave the profession.

<b>Taylor et al (2015)</b> Injury Risks of EMS providers	USA	To investigate commonly reported injury mechanisms and prevention opportunities among EMS responders who reported events to the National Fire Fighter Near-Miss Reporting System.	Cross Sectional Mixed Methods study	24% (185/769) reports were included for analysis.	Violence was determined after evaluating near-miss event or injury during an EMS activity (e.g., encounter with an armed patient in an ambulance).	N/A	48 (25.7%) of reports included assault as the mechanism of injury.	N/A	1. Injuries from assault include: Struck by person, bite, struck by motor vehicle, cut by piercing instrument or object. 2. 4 (2.1%) of reports included firearms and 6 (3.2%) of reports included cutting, piercing instruments, and objects as the mechanism of near-miss or injury.	The most frequent mechanism of near-miss or injury in EMS responders was assaults. Multiple social and environmental factors contributing to these assaults were identified. Additionally, this study further supports the use of narrative data in occupational injury prevention.
<b>Oliver &amp; Levine (2015)</b> Workplace Violence: A Survey of Nationally Registered EMS Professionals	USA	To investigate how patient initiated workplace aggression was related to characteristics of nationally registered EMTs.	Cohort Study	41% (1,900/4,670).	Defined five forms of violence: being cursed or threatened; being punched, slapped or scratched; being spat upon; being stabbed, or experiencing a stabbing attempt, and; being shot or experiencing a shooting attempt.	67% of respondents reported that they or their partner had ever been cursed or threatened by a patient.	45% reported ever being punched, slapped, or scratched, 41% reported being spat upon; 4% reported being stabbed or involved in an attempted stabbing, and 4% reported being shot or involved in a shooting attempt by a patient.	N/A	1. 50% felt adequately trained to restrain a violent patient. 2. 14% experienced difficulty in obtaining police assistance while on a call. 3. 76% of respondents worked for services that did not provide body armor, and 88% had never used body armor.	Violence varied across several personal and organizational factors. Providers in urban areas seem to be especially at risk for encountering violence from patients. Authors suggest future studies should evaluate programs and systems that reduce violence and improve provider safety.
<b>Furin (2015)</b> Self-Reported Provider Safety in an Urban Emergency Medical System	USA	To describe self-reported abuse and perceptions of safety and to determine if there are differences between gender, shift, and years of experience in an urban EMS system.	Secondary Cross-Sectional Study	89% (196/221).	Not defined.	88% reported that they had been verbally abused or threatened.	80% reported that they had been physically assaulted while at work.	N/A	1. 40 % reported that they went to the hospital post-physical assault. 2. 49% replied that they reported the assault to police. 3. EMS responders with two or more years of experience were more likely to have been victims of physical assault. 4. Female providers reported greater fear for their safety at work compared to their male colleagues.	The majority of EMS providers surveyed experienced assault, sought medical care following the incident, and did not report the event to police. Additional research is recommended to enhance safety mechanisms for EMS.
<b>Taylor et al (2016)</b> Expecting the Unexpected: A Mixed Methods Study of Violence to EMS Responders in an Urban Fire Department	USA	To describe EMS experiences with patient-initiated violence.	Cross Sectional Study	10 (100%) qualitative participants.	"Struck or injured by" injury reports were then text-mined for reference to patient-initiated violence; Qualitative interviews asked participants to describe their experiences with violence.	N/A	N/A	13.71% of injuries caused by "struck or injured by" sources.	1. Paramedics were more likely than firefighters to experience a patient-initiated violent injury (OR 14.4, 95%CI: 9.2–22.2).	Mixed methods revealed several factors related to violence including: underreporting of injury, non-specific information from dispatchers, community expectations, psychological impact of the injury, leadership support, lack of procedural justice from the legal process, training needs, and the work environment.
<b>Gormley, Crowe, Bentley &amp; Levine (2016)</b> A National Description of Violence toward EMS Personnel	USA	To describe the prevalence of violence directed at EMS personnel by type and source and to identify characteristics associated with experiencing violence.	Cohort Study	59.30% (2515 of 4238) of responses were received, and 1,789 met the inclusion criteria.	Defines seven types of violence: cursing or making threats; punching, slapping, or scratching; spitting; biting; being struck with an object; stabbing or stabbing attempt; and shooting or shooting attempt.	69% experienced at least one form of violence in the past 12 months, 67% experienced verbal violence.	43.6% reported physical violence.	N/A	1. Paramedics had nearly triple the odds of experiencing physical (OR = 2.67, 95% CI = 2.06–3.46) and verbal (OR = 2.63, 95% CI = 1.99–3.46) violence compared to EMTs. 2. Urban personnel had increased odds of experiencing physical (OR = 1.53, 95% CI = 1.21–1.93) and verbal violence (OR = 1.32, 95% CI = 1.02–1.71)	Creates a national baseline of the prevalence of several types of physical and verbal violence, as well as the sources of violence in EMS in the U.S. This is one of the first nationally representative studies of its kind in the U.S.

<b>Gomez-Guiterrez et. al., (2016)</b> Posttraumatic stress symptomology in pre-hospital emergency care professionals assaulted by patients and/or relatives: Importance of severity and experience of the aggression	Spain	To assess the development of posttraumatic symptoms in pre-hospital emergency care professionals that have been assaulted.	Cross Sectional Study	90%	Not defined.	75.3% experienced insults or slander.	34.5% reported physical assault.	N/A	1. 2.2% of participants met the diagnostic criteria for PTSD.	Experiencing violence on the job may contribute to the development of PTSD symptomology. It is appropriate to establish support measures for professionals who experience violence with the aim to minimize the impact of the psychological consequences.
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