

Table 3: Academic Literature Used in the Systematic Review – Murray et al.

Author (Year), Title	Main Theme in Literature Review	Industry Setting: EMS, hospital, or EMS and hospital	Study Origin	Research Question(s)/Purpose:	Discussion/Implications for Future Research	Weight of Evidence (See Figure 2)
Hogya (1990) Evaluation of the Injury Profile of Personnel in a Busy Urban EMS System	Evolution of the definition of violence	EMS	USA	To evaluate the injury profile of EMS responders.	Assaults were the cause of 17% of injuries; however, those injuries were not described, nor was assault formally defined or acknowledged in the discussion. Patients and bystanders were the cause of 12% and 5% of assault-related injuries, respectively.	Cross Sectional Study
Federiuk, C., O'Brien, K., Jui, J., Schmidt, T. (1992) Job satisfaction of paramedics the effects of gender and type of agency of employment	Psychosocial Impact	EMS	USA	To determine factors related to job satisfaction and job performance in EMS.	Authors found a significant association between type of agency and gender with job satisfaction.	Cross Sectional Study
Boudreaux, E., Jones, G.N., Mandry, C., & Brantley, P.J. (1996) Patient care and daily stress among emergency medical technicians	Psychosocial Impact	EMS	USA	To explore the relationship between the EMS provider and the patient, and the extent to which patients contribute to job stress.	Patients cause significant job stress for EMS providers.	Cross Sectional Study
Grevin, F. (1996) Posttraumatic stress disorder, ego defense mechanisms, and empathy among urban paramedics	Psychosocial Impact	EMS	USA	To describe the levels of PTSD, ego defense utilization, and empathy in paramedics and paramedic students.	Found PTSD levels in paramedics and paramedic students to be 20%.	Cross Sectional Study

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Jenkins, L. (1996) Violence in the Workplace: Risk Factors and Prevention Strategies	Intervention Opportunities	EMS	USA	To describe what is known about fatal and nonfatal violence in the workplace to determine the focus needed for prevention and research.	Recommends that workplace violence prevention programs should include a system for documenting incidents, procedures to be taken in the event of incidents, and open communication between employers and workers.	Systematic Review
Marmar, C., et al. (1996) Stress responses of emergency services personnel to the Loma Prieta earthquake interstate 880 collapse and control traumatic incidents	Psychosocial Impact	EMS	USA	To discuss the impact of the Loma Prieta Earthquake on the trauma experiences of first responders.	EMTs and paramedics were found to have higher rates of PTS symptomology compared to their police and fire counterparts that were also involved in the incident.	Cross Sectional Study
Boudreaux, E., Mandry, C., & Brantley, P.J. (1997) Stress, job satisfaction, coping, and psychological distress among emergency medical technicians	Psychosocial Impact	EMS	USA	To describe the degree to which job stress is related to job satisfaction, and to evaluate effectiveness of coping strategies used in EMS.	Job satisfaction and psychological well-being is significantly associated with the degree of job stress in EMS.	Cross Sectional Study
Clohessy, S., & Ehlers, A. (1999) PTSD symptoms, response to intrusive memories and coping in ambulance service workers	Psychosocial Impact	EMS	England	To examine the relationship between coping strategies and PTSD in EMS workers.	Over 20% of survey respondents met criteria for PTSD. Additional resources and support are needed for EMS responders with post-traumatic symptomology.	Cross Sectional Study

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Lucas (1999) Violence in the Prehospital Setting	Historical and Contextual Grounding	EMS	USA	To describe existing literature on the topic of violence in the pre- hospital setting.	Reviews existing statistics from seminal articles that have researched violence against EMS responders and suggests needed improvement in trainings to prepare EMS responders for potential violence.	Case Series
Thomsen, Sayah, Eckstein, Hutson (2000) Emergency Medical Services Providers and Weapons in the Prehospital Setting	Characteristics of perpetrators of violence	EMS and Hospital	USA	To investigate EMS providers' experiences with weapons encountered while working and evaluate the training they have received regarding searching for and confiscating weapons in the field.	The findings suggest that weapons encountered on patients are a widespread problem in EMS. While only 42% of respondents reported searching patients for weapons, 62% of respondents reported having found a weapon on a patient. Includes the need for prospective studies and multidisciplinary discussions to address the issue of violence and weapons occurring in EMS.	Cross Sectional Study
Vettor, S.M., & Kosinski, F.A. (2000) Work-Stress Burnout in Emergency Medical Technicians and the Use of Early Recollections	Psychosocial Impact	EMS	USA	To describe the association between burnout and employee attrition rates in EMS.	Suggests the need for early recognition of burnout in EMS responders, as it may have significant organizational benefits.	Systematic Review
Jonsson, A., Segesten, K., & Mattsson, B. (2003) Post-traumatic stress among Swedish ambulance personnel	Psychosocial Impact	EMS	USA	To investigate the prevalence of post-traumatic stress disorder among Swedish ambulance personnel.	Authors establish a need for improved organizational response and support for EMS responders experiencing post-traumatic stress.	Cross Sectional Study

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Bennett, P., Williams, Y., & Page, N. (2004) Levels of mental health problems among UK emergency ambulance workers	Psychosocial Impact	EMS	England	To examine the prevalence of post-traumatic stress disorder (PTSD), depression, and anxiety in emergency ambulance personnel.	Suggests that the prevalence rate for PTSD is over 20%, however the authors caution their findings, and findings from similar studies, because they are based on self-report measures and may be at risk for response bias.	Cross Sectional Study
Kowalenko, Walters, Khare, & Compton (2005) Workplace Violence: A survey of emergency physicians in the state of Michigan	Characteristics of perpetrators of violence	Hospital	USA	To assess the experiences of attending emergency physicians about violence in the workplace.	Authors find that the majority of violent incidents are due to verbal threats or abuse, however there is significant incidence of physical assaults. Emergency physicians (EPs) who are fearful for their safety are taking alternative measures to feel safe, these include purchasing weapons and escorts from security guards.	Cross Sectional Study
Flannery, Walker, & Flannery (2006) Elderly patient assaults: empirical data from the assaulted staff action program (ASAP) with risk management implications for EMS personnel	Characteristics of perpetrators of violence	EMS and Hospital	USA	To examine the characteristics of assaultive elderly patients in a 15-year longitudinal, retrospective study.	Findings are consistent with other studies conducted in health care and EMS systems that elderly patients may become assaultive when receiving care.	Cross Sectional Study
Munding (2006) Violence against firefighters: Angels of mercy under attack	Best Practices	EMS	USA	To identify what approaches relating to violence against fire fighters are available.	Trainings are needed in: scene size-up, weapons awareness, weapons management, approaching the scene, approaching a vehicle, entering a structure, conflict management, searching and confiscation of weapons, self-defense techniques, legal issues surrounding self-defense, use of force, and	Systematic Review

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					cover and concealment techniques.	
Shah (2006) The Formation of the EMS System	Historical and Contextual Grounding	EMS	USA	To describe the evolution and rapid development of EMS which has contributed to the limitations the system experiences today.	Several medical, historical and social forces have shaped the development of the EMS system. These forces and subsequent limitations must be understood to modify the system into one that provides uniform high-quality care to all patients.	Background Information, Ideas, Opinions and Editorials
Sterud, Ekeberg, & Hem (2006) Health Status in the ambulance services: A systematic review	Psychosocial Impact	EMS	N/A	To describe findings from a systematic review of ambulance personnel health.	The review discusses the various research on PTSD, burnout, depression and anxiety, medical impairment and early retirement, somatic health, mortality, fatal accidents, and injuries. Concludes that more quality research is needed.	Systematic Review
Koritsas, Coles, Boyle, & Stanley (2007) Prevalence and predictors of occupational violence and aggression toward GPs	Estimates of Violence	Hospital	Australia	To examine occupational violence and aggression against General Practitioners (GPs) in terms of prevalence and predictive factors.	GPs experience a high level of verbal abuse, property damage or theft, and intimidation. There is a need for the development of guidelines and policies to address occupational violence and aggression.	Cross Sectional Study
Studnek, Ferketich, & Crawford (2007) On the job illness and injury resulting in lost work time among a national cohort of EMS professionals	Historical and Contextual Grounding	EMS	USA	To estimate the prevalence and incidence of job-related illness or injury resulting in lost work time and determine what characteristics are associated with the occurrence of illnesses or injury among a cohort of national EMS professionals.	EMS professionals have one of the highest incidences of injury with days away from work at 8.1 work related injuries per 100 workers. Call volume, history of recent back problems, community size, and certification levels were all	Cohort Study

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					associated with reporting an on the job injury.	
Donnelly & Siebert (2009) Occupational Risk Factors in the EMS	Psychosocial Impact	EMS	USA	To identify potential factors that may influence whether an EMT has a stress reaction due to occupationally related stress exposures.	Chronic stress, critical incident stress, and social support impact EMTs. Approximately 80-100% of EMTs reported being exposed to a traumatic event, and rates of PTSD are less than 20%.	Systematic Review
Perkins, DeTienne, Fitzgerald, Hill, & Harwell (2009) Factors Associated with Workforce Retention Among EMTs in Montana	Psychosocial Impact	EMS	USA	To assess the potential factors associated with workforce retention among EMTs.	Found a high rate of employees (one in four) are planning to leave the field within the next five years. 11% of survey respondents indicated job stress as reason to leave the EMS profession.	Cross Sectional Study
Greenwood & Heninger (2010) Structured Communication for Patient Safety in EMS: A Legal Case Report	Best Practices	EMS	USA	To highlight the importance of using structured forms of communication.	Emergencies can cause high “communication load” and overwhelm the short-term memory. Techniques exist to help EMS responders ensure that vital information and critical phases are acknowledged, received, and followed through.	Case Report
Behnam, Tiltson, Davis, & Hobbs (2011) Violence in the Emergency Department: A national survey of emergency medicine residents and attending physicians	Estimates of Violence	Hospital	USA	To estimate the overall incidence of violence experienced by faculty and resident physicians working in Emergency Departments located in the U.S.	While there is a high incidence of violence occurring in the Emergency Department, faculty and physicians are not adequately trained to search patients for weapons or in self-defense.	Cross Sectional Study

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Gates et al. (2011) Occupational and Demographic Factors Associated with Violence in the Emergency Department	Estimates of Violence	EMS and Hospital	USA	To describe the frequency of violence against ED health care workers, identify whether demographic and occupational characteristics of ED health care workers are related to violence, and evaluate the relationship between level of confidence when dealing with workplace violence and demographic and occupational characteristics.	The study found that there was no gender-based differences in exposures to violence, except for sexual harassment. Authors found no association between race, age, educational level, and primary work shift with violence. Also, no difference in physical assaults, verbal harassment, and sexual harassment between study sites.	Cross Sectional Study
Reichard, Marsh, & Moore (2011) Fatal and Nonfatal Injuries among EMTs and Paramedics	Estimates of Violence	EMS	USA	To provide data on fatal and nonfatal injuries and illnesses to EMTs and paramedics.	The compensated- EMT fatality rate was seven per 100,000 FTE EMTs for the 2003-2006 period (FF=6.1). Strains and sprains are the most common non-fatal injury. Assault and/or violence was not mentioned as a cause for injury.	Case Series
Somes, Donatelli, & Kuhn (2011) Controlling aggressive behavior in the geriatric patient	Characteristics of perpetrators of violence	Hospital	N/A	To examine elderly combative patients.	Reasons for aggression were related to delirium, infection, fluid and electrolyte imbalance, hypoxia, drug toxicity, renal failure, hypoglycemia, shock, and withdrawal from alcohol or sedatives.	Case Report
van Leeuwen & Harte (2011) Violence against care workers in psychiatry: Is prosecution justified?	Evolution of the Definition of Violence	Hospital	USA	To review the literature to better understand the influential factors of reporting violence and prosecuting and convicting patients who assault their health care providers.	Health care workers who are victims of violence often cope with feelings of anxiety, fear, self-blame, demoralization, and PTSD.	Systematic Review

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Kowalenko, Gates, Gillespie, Succop, & Mentzel (2013) Prospective study of violence against ED workers	Estimates of Violence	Hospital	USA	To describe the incidence of violence in ED health care workers over a 9-month time frame.	Concludes that despite a high prevalence of workplace violence in health care settings, no single intervention program has been proven to reduce or sustain decreased acts of violence against health care workers.	Case Control Study
Larsson & Gill (2013) Lay definitions of violence among Swedish children, teenagers and adults	Evolution of the Definition of Violence	N/A	Sweden	To describe the variation of definitions of violence and the implications a non-standardized definition has upon violence related research.	Discusses definitions of violence and changing perceptions of violence.	Systematic Review
Autrey, Hick, Bramer, Berndt, & Bundt (2014) Three Echo: Concept of Operations for Early Care and Evacuation of Victims of Mass Violence	Best Practices	EMS	USA	To describe the successful use of a simple three-phase approach that guides EMS responders through hostile scenes presenting unique hazards.	Supports the need for multi-disciplinary collaboration and communication, especially when responding to violent and mass-hostile events.	Case Report
Bernaldo-de-Quirós, et al. (2014) Workplace violence in prehospital emergency care: a systematic review and outlines of psychological intervention	Psychosocial Impact	EMS	N/A	To conduct a systematic literature review and suggest opportunities for psychological intervention in EMS.	Authors advocate for specialized and improved trainings, communication, risk identification, implementation of safety measures, and psychological support.	Systematic Review
Morrison (2014) Coping Techniques, World Assumptions, and Level of Post-Traumatic Stress in EMTs	Psychosocial Impact	EMS		To describe the daily stressors and effects that working in EMS has on mental health and responders' worldview.	Findings reveal a significantly higher rate of PTSD (25%) among EMTs than the general population (7-8%). This study also found no relationship between years working in the field and PTSD.	Cross Sectional Study

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Thompson, Rehn, Lossius, & Lockey (2014) Risks to Emergency Medical Responders at Terrorist Incidents: A narrative review of the medical literature	Psychosocial Impact	EMS	USA	To review the literature and identify the hazards experienced by EMS responders who have attended previous terrorist incidents.	Discusses the need for evidenced-based interventions and training to protect EMS responders during dangerous incidents, such as terrorist events. Suggests several mental health protective factors, including: good pre-event mental health, disaster preparedness training, and shift rotations that limit the duration of an individual's exposure to the scene.	Systematic Review
Yilmaz, Dal, Yaylaci, & Uyanik (2014) Rate of Exposure to Violence in 112 Staff in Denizli City	Estimates of Violence	EMS	Turkey	To investigate violence directed toward emergency service staff.	Authors find that a small number of violent acts are reported in Turkey; there is a great need to improve reporting practices.	Cross Sectional Study
Bernaldo-de Quirós et al. (2015) The Psychological Consequences of aggression in prehospital emergency care	Psychosocial Impact	EMS	Spain	To evaluate the psychological consequences of exposure to workplace violence from patients and those accompanying them in pre-hospital emergency care.	Limited research exists that links violence on the job to burnout.	Cross Sectional Study
Cannuscio et al. (2015) A Strained 911 System and Threats to Public Health	Psychosocial Impact	EMS	USA	To understand safety climate in the U.S. fire service.	Improvements need to be made to the 911 system including better systems of triage, more targeted use of EMS resources, continuing education to align with job demands, and a strengthened social safety net to address	Cross Sectional Study

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					persistent needs of populations.	
Erdur et al. (2015) Assessment of the relation of violence and burnout among physicians working in the emergency departments in Turkey	Psychosocial Impact	Hospital	Turkey	To assess the experience of workplace violence, burnout, and the relationship between the attending emergency physicians within the EMS system.	Strong association between burnout and violence among emergency department physicians. Recommends areas of inquiry for future research on the impact of violence and burnout.	Cross Sectional Study
Pourshaikhian et al. (2016) A Systematic Literature Review: Workplace Violence Against EMS Personnel	Discussion	EMS	N/A	To discuss the characteristics and findings of studies on workplace violence against EMS personnel in the extant literature.	Summarizes the prevalence rates of workplace violence and injuries incurred by EMS providers. Suggests the need for more robust research.	Systematic Review
Renker, Scribner, & Huff (2015) Staff perspectives of violence in the emergency department: Appeals for consequences, collaboration, and consistency	Best Practices	EMS and Hospital	USA	To identify and describe staff experiences, concerns, and perceptions related to violence and abuse perpetrated by patients, family, and non-family visitors.	The study identified concerns of ED nurses about workplace violence, including avoiding patients, lack of trust and support, safety concerns, disruption in patient care, and feeling that violence is part of the job.	Cross Sectional Study