

A Systematic Literature Review: Workplace Violence Against Emergency Medical Services Personnel

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Abstract

Context: In spite of the high prevalence and consequences of much workplace violence against emergency medical services personnel, this phenomenon has been given insufficient attention. A systematic review can aid the development of guidelines to reduce violence.

Objectives: The research question addressed by this paper is, "What are the characteristics and findings of studies on workplace violence against emergency medical services personnel?"

Data Sources: A systematic literature review was conducted using online databases (PubMed, Scopus, Google Scholar, and Magiran) with the help of experienced librarians.

Study Selection: Inclusion criteria comprised studies in the English or Persian language and researcher's access to the full text. There was no limit to the entry of the study design. Exclusion criteria included lack of access to the full text of the article, studies published in unreliable journals or conferences, and studies in which the results were shared with other medical or relief groups and there was no possibility of breaking down the results.

Data Extraction: A "Data extraction form" was designed by the researchers based on the goals of the study that included the title and author(s), study method (type, place of study, sample size, sampling method, and data collection/analysis tool), printing location, information related to the frequency of types of violence, characteristics of victims/perpetrators, and related factors.

Results: The papers reviewed utilized a variety of locations and environments, methods, and instrument samplings. The majority of the studies were performed using the quantitative method. No intervention study was found. Most studies focused on the prevalence of violence, and their results indicated that exposure to violence was high. The results are presented in six major themes.

Conclusions: Workplace violence and injuries incurred from it are extensive throughout the world. The important causes of violence include the shortage of training programs dealing with violence, lack of violence management protocols, and delays in response times. Therefore, afterthought and resolve are more crucial than ever. Workplace violence reduction strategies and suggestions for future studies are also discussed.

Keywords: Literature Review, Workplace Violence, Emergency Medical Services

1. Context

Workplace violence (WPV) is defined as any incident or situation in which a person is threatened or attacked at work or under related conditions (1). Today, it is generally accepted that WPV is a common occurrence among medical jobs (2-7), and statistics show that 70-80% of doctors, nurses, emergency medical personnel, and public service workers will encounter one or more instances of violence annually (8). Violence against the prehospital emergency setting is less considered (9). Therefore, as of yet, there is no complete understanding of the incidence factors or recommendations for specific professional communities on

how to solve the problem of violence. WPV is an aggressive act that includes physical or verbal assault, insult, or verbally intimidating behavior that occurs at work. Physical violence is defined as pushing, punching, kicking, grabbing, or any type of physical aggression. Verbal violence refers to annoying behavior, emotional abuse, and aggression (10). Emergency medical services (EMS) personnel are trained to provide medical care or intervention services to injured or ill persons (4). They are the first ones who respond to the emergency needs of people (11). They work in various critical situations and need to react appropriately to safely transport patients to medical centers. Some-

times, they may encounter threats and violent reactions (7) in these unstructured environments (12). The high prevalence of WPV has been reported in a few studies (13), indicating the extent of the problem (11, 14).

The WPV may lead to complications for staff, organizations, and society. Even the fear of encountering it creates occupational stress (12), thereby negatively affecting the health of employees, organizational performance, and efficiency (5, 11). One study stated that 25% of WPV cases were injury-related incidences, of which 37% required medical care (9). Various factors are involved in the incidence of WPV (9), and some studies have shown that violent incidents are not reported by employees (4). Other studies have offered recommendations for the control of violence, including staff training and the development of protocol for exposure to violence (5, 15), but there are officially still no policies or procedures for the control of violence-causing situations (6). Even with the high prevalence of WPV and its consequences, a serious consensus has not yet been established about violence management.

2. Objectives

A systematic review of the existing literature has been proposed as a key method of integrating the evidence (16). This study purposes to answer the question, "What are the characteristics and findings of studies conducted over 25 years on WPV against EMS personnel?"

2.1. Add in Value

This is the first systematic literature review of WPV against EMS personnel.

3. Data Sources

This study is a systematic review of the basic research carried out in the field of WPV against EMS staff from around the world that has been published in English or Persian in the past 25 years (1990 - 2014). The present study was conducted according to a predesigned protocol.

3.1. Search Strategy

Searches were performed through electronic databases, including: PubMed, Scopus, Google Scholar, and Magiran, with the help of experienced librarians and using the following keywords: violence, aggression, assault, workplace, ambulance, paramedic, emergency medical technician, prehospital, emergency medical services, and EMS. Manual searches were conducted by tracking article references. The searches were carried out in September of 2014.

4. Study Selection

4.1. Inclusion and Exclusion Criteria

Inclusion criteria comprised the following: 1) original research published in credible sources, 2) research related to WPV against EMS personnel, 3) studies published within the past 25 years, and 4) English or Persian studies. Exclusion criteria included the lack of access to the full text of an article, studies published in unreliable journals or conferences, and studies in which the results were shared with other medical or relief groups and there was no possibility of breaking down the results. No restrictions were placed on study design or methodology.

5. Data Extraction

To review the data, a "Data extraction form" was designed by the researchers based on the goals of the study that included the title and author(s), study method (type, place of study, sample size, sampling method, and data collection/analysis tool), printing location, information related to the frequency of types of violence, characteristics of victims/perpetrators, and related factors.

5.1. Evaluation of Studies

The search results are based on keywords in study titles and abstracts. Thirty-three papers and one dissertation were accessed, and after reading the title and abstracts, 28 cases were selected. Five papers were excluded for the following reasons: one study was published in three journals, and the most complete article was selected; one paper had common indivisible results with medical and relief groups; one article was published at two different times, and the full text of one article was not accessible. Thus, at this point, 23 papers were included in the study, and two researchers evaluated the full text of each of them. To assess the quality of the articles, the "Guide to evaluation of prevalence studies checklist" introduced by Vameghi et al. (17) was used. For the qualitative evaluation of studies, the design, proportion of the target population, description of inclusion/exclusion criteria, sampling, and sample size were considered. Each article was evaluated and classified by two researchers, and the papers of medium to high quality were included. In evaluating the quality of the articles with an emphasis on the approach used, more weight was given to papers with a stronger summary of results. The qualitative assessment excluded five more papers, and ultimately, 18 articles were selected (Figure 1).

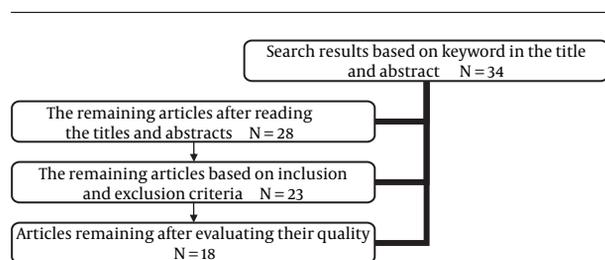


Figure 1. Flowchart of Systematic Review

6. Results

The results of the reviewed studies can be presented in six major themes: “Frequency of violence,” “Characteristics of perpetrators/victims,” “Response to violence and reporting,” “Consequences of violence,” “Predisposing factors,” and “Prevention factors of violence.” Tables 1 - 9 summarize the characteristics of WPV and the major findings.

6.1. Frequency of Workplace Violence

In nine studies (50%), it was reported that about 53 - 90% of personnel have experienced WPV. In four studies (22%), violent incidence was about 0.8 - 8.5% according to ambulance missions. Exposure to types of physical or verbal violence in 12 studies (67%) and threats or intimidation, sexual violence or assault, or harassment in five studies (28%) were reported. The frequency of verbal violence was about 21 - 82% and occurred mostly as insults and humiliation. Physical violence, such as pushing, punching, scratching, kicking, slapping, biting, or the use of weapons, was reported to occur in about 13 - 79% of cases. Intimidation and/or threats were experienced by 10 - 55% of personnel. Victims were threatened by a variety of weapons, including knives, sticks, and firearms. Threats made with firearms were reported in two studies as 17% and 27%, respectively (7, 11). Furthermore, incidents of cultural assaults, sexual assaults, and harassment were reported to be 9.5%, 15.5%, and 3.5%, respectively.

6.2. Characteristics of Perpetrators and Victims

Perpetrators of workplace violence were mentioned in eight articles (44%), and in 29 - 87% of the cases, patients and their relatives/associates and less often others/bystanders were perpetrators of the violence. The results of the review differ on the characteristics of the victims of violence. Some studies showed that men (4) and those with extensive work experience (9) were exposed to more violence; others showed that the less experienced were exposed more to violence (7, 12), and most often, women encountered sexual assault (9). Another study

showed that in recent years, gender, work experience, and professional group do not differ significantly in the face of threats and/or violence (11).

6.3. Response and Reporting

In the literature reviewed, five articles (28%) reported the personnel reactions to exposure to threats and/or violence. On average, half the employees considered it normal, unimportant, and “Part of the job.” Seven articles (39%) reported that victims of WPV underreported the frequency of violent episodes. The fear of being negatively judged by managers, considering the report useless, and fear of revenge were the important causes of underreported violence. Some studies noted the absence of reporting mechanisms for ambulance missions (6, 15).

6.4. Workplace Violence Complications

Bodily injury from physical violence was reported in eight papers (44%), ranging from 4% to 67% (average 44%). In most cases, injuries were minor, but there were cases of serious injuries. In two studies, the need for medical care was 27% and 37%, respectively. Psychological injuries in the form of stress or PTSD, anxiety, nervousness, sensitization, increased psychological strain, demoralization, mental exhaustion, and depersonalization were reported in nine studies (45%). The review of eight articles (44%) showed the prevalence of organizational damages in the form of threatened job safety, increased sick leave, decreased job satisfaction, mental energy, work effectiveness, participation in the work process and decision making, occupational leave, burnout, and decreased well-being as well as theft or damage to the property of the organization. These effects increase the costs of both the emergency organization and society. One study reported that in 80% of cases, incidence of WPV and its effects had a negative impact on the relationship between patient and EMS personnel and caused a drop in quality of care (7).

6.5. Predisposing or Predicting Factors

A shortage or lack of formal education in terms of exposure to violent situations was studied as a predisposing factor in 13 articles (72%), and it was reported that 9 - 97% of employees didn't have adequate formal education. Six studies showed that 52% of personnel believe there is no specific protocol for the handling of WPV. In five articles (28%), delayed response to the emergency situation was reported as a predisposing factor (3, 12, 21-23). In four studies (22%), drug abuse and alcohol (4, 7, 11, 18) and, in two studies, (11%) psychological disorders were reported as factors leading to the escalation of violence (4, 11, 18). Other important predicting factors reported in some of the studies

Table 1. [Part 1] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
1	Violent patient and prehospital providers	Tintinalli et al. 1993	Estimate the frequency of violence directed toward prehospital providers. Identify the methods used to manage violent patients. Identify the medical, educational, and legal issues related to the management of violent patients.	A convenient sample survey and a descriptive review of ambulance call reports. Registrants (4200) at national association of EMS physicians in USA.	Review of ambulance call reports for documentation of terms, violent or combative and verbal threats or physical violence, and also review of policies and procedures for management of violent patients.	Moderate	There was a 0.8% incidence of violent episodes in ambulance call report review. Only about 50% of survey respondents reported having a protocol for the management of violent patients. Injury to the prehospital providers in the past years was reported at 67% of respondents, and 67% had some training in management of violent patients, and 25% had trained in assessing the scene of potential violence.	(15)
2	Exposure of prehospital care providers to violence	Corbett et al. 1998	Evaluate the experience of prehospital care providers with violence.	Emergency medical services (EMS) providers (522) in California, USA.	The questionnaire. Descriptive statistics. Chi square analysis. Correlation analysis. P < 0.05 significant	Relatively good	A total of 61% recounted assault on the job, and 25% had injury from assaults; 37% required medical attention; 35% said their company had a specific protocol for managing violent situations, and 28% stated ever having received formal training in the management of violence; 73% used protective gear.	(3)

include unexpected illness, injury or death (21, 22), insufficient safety and lack of police presence at the scene (4, 11, 13, 18), inadequate skills and incompetency of personnel (23), and lack of awareness of EMS duties of (21-23).

6.6. Prevention Factors

In addition to predisposing factors, other factors were considered to prevent violence or injury. In four studies (22%), the use of special protective, impenetrable clothing and helmets (3-5, 15) were mentioned. Two studies showed

that these clothes are available on average 63% for personnel (3, 15). Other important preventing factors included proper behavior with a patient or relative (15, 23), control of crowds and aggressors (3), management of unsafe scenes (4, 5, 7), the use of self-protection or self-defense (5, 7, 9, 15), a responsible and supportive approach of society (9) and the organization (10-13, 20), and attention to the energy loss of staff due to a long and stressful shift (13).

Table 2. [Part 2] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
3	Prospective Field Study of Violence.	Mock et al. 1998	Investigate the nature and frequency of violence encountered by EMS personnel.	EMS providers (297) were members of a countywide study in Tennessee, USA.	The questionnaire, prospective observations. Overt aggression scale (OAS). Data analysis: descriptive statistics, Fisher and t test, CI: 95%, Bonferroni correction. P < 0.05: significant.	Good	There were 5% violent runs with one violent episode for every 19 runs. The violent behaviors were verbal aggression solely, 50% (n = 8); physical aggression solely, 13% (n = 2); both verbal and physical aggression, 38% (n = 6). Exposure to violence is underreported in EMS documentation.	(18)
4	Exposure of prehospital providers to violence and abuse.	Pozzi et al. 1998	Quantify the current existence of violence toward EMS personnel. Violence-related policies and appropriate training at EMS agencies.	EMS personnel (331) in fire department in Albuquerque, New Mexico, USA.	The questionnaire. Validity was measured per question response. Descriptive statistics analyzed question responses.	Relatively good	A total of 90% said an assault or violent action had been directed during their work. Abusive and violent situations were the number 1 stressors; 71% had no clear protocols to handle abusive situations; 71% said abusive situations were considered a "Part of the job," and there was a lack training to learn how to protect them; 80%, felt angry and 69% felt irritable after experiencing assault.	(6)

7. Conclusions

The literature review indicated that WPV against EMS personnel is a common and increasingly prevalent event in the world. Most studies were descriptive and prevalence studies that focused on a variety of verbal and physical violence and reported the extensive and prevalence of violence as verbal, physical, and threatening, respectively. Sexual violence had a very low incidence rate (2, 9, 13, 21, 23). The high consequence of violence against EMS personnel, organizations, and ultimately society indicates a need for more serious consideration of a remedy and resolution now more than ever. In two systematic reviews of violence in hospital emergency departments, similar results were obtained, suggesting that it is considerable (24, 25).

Psychological illnesses and the use of drugs, alcohol, and opiates by perpetrators of violence were introduced as predisposing factors (4, 7, 11, 18).

Most studies indicated that the high prevalence of violence in the EMS caused physical and psychological damage to personnel, which in many cases required medical care, in addition to the imposition of high costs to the EMS staff. A study by Suserud showed that exposure to violence also harmed patient care (7). Therefore, compensation for injuries and the consequences of exposure to violence, legal and financial support of staff, specialized counseling, and psychological treatment to analyze situations and reactions will help reduce the above-discussed complications.

Table 3. [Part 3] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
5	Exposure of French EMS personnel to violence	Duchateau et al. 2002	Evaluate the problem of violence in French EMS system and characterize assaults.	The prehospital care providers (276) in Paris area, France.	The questionnaire about assaults during their careers, typology of the assaults and consequences. Descriptive analysis: Results are presented in percentage and means	Good	23%: one or more assaults. 40%: injured, wounds in 9% and fractures in 2%. 4% of assaults were followed by sick leave, 15% by a complaint. 4%: reported having received therapy against PTSD. 88% and 41% verbal and physical threat, consequently. 13%: threatened with a knife, 12% with a gun.	(19)
6	Violence against EMS Personnel	Grange et al. 2002	Determine the prevalence of violence against EMS providers in the prehospital setting. Determine associated factors.	Consecutive medical calls (4102) for EMS agencies in California, USA.	Demographic and situational data from the standard ambulance run sheets. Analysis: Prospective analysis descriptive, chi-square, regression with 95% CIs, $P < 0.05$ was significant.	Relatively good	53%: prevalence of violence against prehospital care personnel. There were 4.5% violent runs. Patients accounted for 89.7% of this violent behavior. 20.7% verbal, 48.9% physical, and 30.4% both verbal and physical attacks. Male, patient age, hour, police presence, psychiatric disorder, alcohol or drug use was associated with episodes of violence.	(4)

The literature review showed that exposure to WPV is underreported due to the attitude of personnel, the belief that violence is “Part of the job,” the fear of being negatively judged, the fear of a vendetta, and the lack of the necessary infrastructure to provide reporting on official ambulance forms (4-6, 9, 13-15, 21). To understand the breadth of the problem and its predisposing factors, there should be a clear picture of the phenomenon that can only be possible with actual reporting. Correcting the attitude of staff and managers, creating a recording system (26), and encouraging reporting would be useful in this area. Pozzi (6) suggested that violence be reported according to OSHA’s guidelines for the prevention of violence (10).

The deficiency or absence of formal sufficient training programs, the absence of a specific protocol on how to manage violent situations (3-6, 14, 15), and delays in re-

sponse time (3, 21-23, 27) are the three major factors in the predisposition to WPV. It seems that qualitative research that can offer deeper investigations of the predisposing factors of WPV is essential. Similar findings were obtained in Taylor and Rew’s study, and the authors emphasized the need for further strong studies to explore these concepts (24).

The high prevalence and increasing rate of WPV suggest that current controls of violence are not sufficiently developed. The review of literature indicated that the main focus of the existing studies lay on the prevalence rates. It is essential that research studies with a stronger design and a focus on the correlations and predictors be performed. Since the purpose of a systematic review is to evaluate and integrate evidence for the use of results in policy making, planning, and implementation, the findings of this study

Table 4. [Part 4] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
7	Injuries from assaults on paramedics and firefighter in an urban EMS	Mechem et al. 2002	To determine the nature and frequency of injuries resulting from assaults on paramedics and in a large fire department-based EMS system.	The retrospective descriptive study involved assaults and occupational injuries on EMS personnel (170000), USA.	Review of injury reports involving assaults. Variables: age, sex, work assignment, activity after assaulted, time (day/week), nature of injury, medical care. Analysis and data report: means (SD), 95% (CIs). SAS statistic software 8.	Relatively good	79.5%: paramedics were assaulted and 4.0% injury reports due to assault during three year. 81.8%: medical attention was sought and in 31.8%, the employee lost time from work.	(5)
8	Experiences of threats and violence in Swedish ambulance service	Suserud et al. 2002	Describe how ambulance personnel perceive. How they are subjected to and are influenced by, threats and violence in their day-to-day work.	Empirical descriptive study consisted of a questionnaire in three ambulance station (sample size: 66) in Sweden.	Questionnaire includes 13 structured and open-ended questions. Descriptive analysis for the prevalence.	Moderate	80.3%: subjected to threats and/or violence. The majority: the relationship between paramedic and patient was most affected when threat or violence is a part of the situation. The most common form of threats and violence was the use of threatening invectives (78%). 67%: subjected to some form of physical violence. 17%: treated with weapons.	(7)

suggest that strategies to reduce WPV at the individual, organizational, and policy levels are essential to bring emergency personnel, researchers, managers, and policy makers together to find appropriate solutions.

7.1. Suggested Strategies to Reduce Workplace Violence

Establish guidelines and formal training/retraining programs to reduce and control WPV in the EMS setting and review periodically. Enact legislation and implement the necessary laws to emergency scene safety and the protection of on-duty personnel.

Public education regarding EMS personnel duties and social support of EMS personnel should be made available. Response time and arrival times of ambulances on the scene should be improved.

7.2. Suggestions for Future Studies

Design stronger studies (qualitative, interventional, and correlational) to explore the process of WPV and present prevention models. Introduce standard instruments for assessing and measuring of WPV in the EMS setting. Develop predicting tools for assessing risks of WPV in the EMS. Review the causes of WPV against EMS personnel from the viewpoint of violence perpetrators.

7.3. Study Limitations

The researchers tried to use extensive search strategies to ensure the review of a maximum number of eligible studies; however, some studies may have been missed. The use of only two languages can cause publication bias. The inability to use the results of unpublished studies can also be a limitation. The methods of some of the studies were

Table 5. [Part 5] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
9	WPV experienced by paramedic relationships with social support, job satisfaction and psychological strain	Brough et al. 2005	Identify the extent and the characteristics of violent incidents. Evaluation of perceived social support, job satisfaction, and psychological strain.	Paramedics (sample: 119) from Australian ambulance service from all of the geographic regions of Australia	Experiences of violence: a six-item measure after test for face validity. Social support: Caplan, 1975 social support scale. Job satisfaction: Warr 1979 instrument. Psychological strain: GHQ-12, 1972.	Moderate	Verbal violence was a significant predictor of both job satisfaction and psychological strain. Both supervisor and colleague support were significantly associated with job satisfaction. Job satisfaction and psychological strain produced a significant negative association as expected. The consequences of exposure to verbal violence are actually more serious compared to the exposure to physical violence.	(20)
10	A pilot study of workplace violence towards paramedics	Boyle et al. 2005	Identify the percentage of paramedics who had experienced six different forms of workplace violence.	Paramedics (119) from the rural (Victoria) and metropolitan the South Australian, Australia	Questionnaire: types of WPV-paramedic's description paramedic's response-impact of event and demographic. Analysis: SPSS, descriptive, proportional differences, CLs 95%, χ^2 test, Fisher's and t-test.	Good	87.5%: exposed to workplace violence. Verbal abuse (82%), intimidation (55%), physical abuse (38%), sexual harassment (17%), and sexual assault (4%). Female more than male experienced sexual harassment and assault. Half the paramedics experienced verbal abuse a few times in last year.	(2)

not clearly stated. Thus, it is recommended that the results of the current study be used with caution.

Table 6. [Part 6] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
11	Hostile Workplace: Violence directed toward rural EMS Personnel	Carlson, 2007	Identify the types of violence. Evaluate EMS personnel's training experiences with regard to WPV. Identify the extent that work-related injuries.	A rural EMS in USA. The sample (96) was chosen from a conference that historically been EMS.	A "Self-designed survey of violence in workplace" questionnaire with a personal opinion and additional comments section. Descriptive statistics. Personal opinion and additional comments were listed.	Good	25%: sustained physical assault, 35%: harassed and 33% threatened by the patient and/or another person (family, bystander, etc.). 37.5%: had received some form of training on how to deal with potentially violent situations. Of particular concern are the reported forms of assault that possess a significant potential for moderate to serious injury (slap, push, hit, kicked, etc.).	(14)
12	Factors associated with Workplace Violence in paramedics	Koritsas et al. 2009	Determine predictors of violence in paramedics	Paramedics (251), the rural Victoria and metropolitan South Australia, Australia	Self-designed questionnaire: six forms of violence: analysis: SPSS 14.0 and discriminate function analysis.	Good	Paramedics who experienced intimidation, sexual harassment and assault were more likely to be female who spent more time in direct patient contact/week were more likely to experience violence. Also, fully qualified paramedics were more likely to experience violence than student paramedics.	(9)

Table 7. [Part 7] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
13	Threats and violence in Swedish prehospital emergency care	Petzall et al. 2011	Investigate the incidents of threats and violence and to describe these situations.	Swedish ambulance services personnel (134) located in four counties in Sweden	Self- designed questionnaire. Analysis: SPSS 16.0, descriptive and inferential statistics, Inferential statistics, chi-square test. P < 0.05 were considered significant.	Good	66%: experienced threats and/or violence during their work; 26%: experienced threats, and 16% faced physical violence. The most common kinds were threats of physical violence, with 27% of the respondents experiencing threats involving weapons. Commonly occurring physical violence was in the form of pushes, punches, kicks, and bites. In most cases, the perpetrator was under the influence of alcohol or drugs. Sex, professional group, and work experience hadn't any importance on the risk of threats; 27%: threatened with some kind of weapon.	(11)
14	Exposure of Iranian EMTs to workplace violence: a cross-sectional analysis	Rahmani et al. 2012	Describe the exposure of Iranian EMTs to workplace violence and to identify the importance of related factors.	Descriptive exploratory study in ambulance personnel (138) in Azerbaijan Province, Iran.	Self-designed questionnaire: demographic data-exposure to five forms of WPV-related factors. Validity and reliability: face and content validity by experts and the test-retest. Analysis: SPSS, descriptive statistics. The results are reported with 95% CI.	Good	75%: experienced at least one form of WPV; 71%: verbal abuse, 38%: physical assault, 9%: cultural harassment, 4%: serious injuries due to violence, 8%: workplace violence that included the use of weapons. Majority: response to WPV was to 'Invite the offender to calm down'. 30%: WPV as a common event in their job.	(21)

Table 8. [Part 8] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
15	Risk factors for workplace violence in EMT student	Koohestani et al. 2012	To determine the prevalence and risk factors for workplace	Descriptive study on emergency medical students (48) in Iran.	Self-designed questionnaire: demographic data, exposure to WPV, response to violence and related factors. Content validity and reliability: test-retest.	Moderate	47.91% and 20.08% of participants had been verbally abused and physically assaulted, respectively. Most physical and verbal violence happened to patients' families. The most common causes of WPV were delay in reaching the scene and lack of knowledge about the role of the EMT	(22)
16	The frequency of violence in workplace against emergency care personnel and the factors affecting the occurrence.	Sheikh-Bardsiri et al. 2013	Determine the frequency of violence in workplace against emergency care personnel and the factors affecting the occurrence.	A descriptive study, on prehospital emergency care personnel (155) of KUMS, Iran.	A researcher-made questionnaire- the frequency of violence in workplace and the affecting factors were assessed. The data were analyzed via descriptive statistics.	Good	83.8%: have experienced violence at least once a year. 67.7%: verbal violence, 22.5%: physical violence and 9.6%: cultural violence. One of important affecting factors of violence occurrence is lack of knowledge about the role of the EMS.	(23)

Table 9. [Part 9] Design and Key Findings of Selected Studies for Systematic Review About Workplace Violence Against Emergency Medical Services Staff

No	Title	Author	Purpose	Setting/Country	Measures/Analysis	Quality	Major Findings	Reference
17	The psychological consequences of aggression in prehospital emergency care	Bernaldo-De-Quiros et al. 2014	Evaluate the psychological consequences of exposure to WPV from patients and accompanying them in prehospital emergency care.	Prehospital emergency care services personnel (441) in Madrid, Spain.	Questionnaire: demographic, level of burnout by Maslach burnout inventory, mental health status using (GHQ). Analysis: SPSS, descriptive chi-square, Kolmogorov, Kruskal-Wallis. $P < 0.05$ was significant. CIs were 95%.	Good	Expose to physical and verbal violence presented a significantly higher percentage of anxiety, emotional exhaustion, depersonalization and burnout syndrome. Frequency of verbal violence (> five times) was related to emotional exhaustion and depersonalization	(12)
18	Paramedic self-reported exposure to violence in the EMS workplace, a mixed-method cross-sectional survey	Bigham et al. 2014	Describe and explore violence experienced by paramedics, types of violence, perpetrator, actions, and effects of these episodes.	Mix method survey on ambulance paramedics (1676) in Canada. qualitative questions about the impact of experiences.	Questionnaire: types of violence and the perpetrators. Open-ended questions to report event details, post-event actions, and the personal impacts. Analysis: descriptive statistics and regression, and qualitative data were analyzed using content analysis.	Good	75%: experiencing violence. 67%: verbal, 41%: intimidation, 26%: physical, 14% and 3%: sexual harassment and assault. Patients were identified as the most common perpetrators of violence. In the qualitative analysis: Serious sequelae were reported, and participants stated that such events were "Part of the job." Paramedics may feel fearful for their safety when responding to calls of similar circumstance.	(13)

Table 10. Summary of Data About Included Studies and Searching Databases

No	Author	Study Place	Study Design	Database	Sample Size	Quality Appraisal	References
1	Tintinalli et al. 1993	USA	Descriptive	Gs	4200	Moderate	(15)
2	Corbett et al. 1998	USA	Descriptive	Gsa. Pm	490	Relatively good	(3)
3	Mock et al. 1998	USA	Observational	Gsa. Pm. Sc	297	Good	(18)
4	Pozzi et al. 1998	USA	Descriptive	Gs. Pm.	331	Relatively good	(6)
5	Duchateau et al. 2002	France	Descriptive	Pm. Sc	276	Good	(19)
6	Grange et al. 2002	USA	Descriptive	Gs. Pm.	410	Relatively good	(4)
7	Mechem et al. 2002	USA	Descriptive	Gs. Pm. Sc	110	Relatively good	(5)
8	Suserud et al. 2002	Sweden	experimental	Gs. Pm. Sc	66	Moderate	(7)
9	Brough et al. 2005	Austria	C.S.	Gs. Sc	119	Moderate	(20)
10	Boyle et al. 2005	Austria	C.S.	Gs. Pm. Sc	160	Good	(2)
11	Carlson, 2007	USA	Descriptive	Gs.	96	Good	(14)
12	Koritsas et al. 2009	Austria	Descriptive	Gs. Pm.	253	Good	(9)
13	Petzall et al. 2011	Sweden	Descriptive	Gs. Pm. Sc	134	Good	(11)
14	Rahmani et al. 2012	Iran	exploratory	Gs. Pm.	138	Good	(21)
15	Koohestani et al. 2012	Iran	Descriptive	Magiran	48	Moderate	(22)
16	Sheikh-Bardsiri et al. 2013	Iran	C.S.	Magiran	155	Good	(23)
17	Bernaldo-De-Quiros et al. 2014	Spain	C.S.	Pm.	441	Good	(12)
18	Bigham et al. 2014	Canada	Mix method	Gs. Pm.	1676	Good	(13)

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Footnotes

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