



Trauma Awareness and Education in Lebanon: An Exploratory Study

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Abstract: Trauma is considered nowadays a leading cause of death worldwide. It is a known fact that tens of millions of people are injured or disabled every year; children, pedestrians, cyclists and the elderly are among the most vulnerable of road users. However, research supports the fact that a better management of ‘Trauma’ patients leads to an increase in the survival rates and a decrease in morbidity and mortality. In an effort to lessen the burden of death and disability from injury, a spectrum of activities needs to be considered, ranging from surveillance and basic research to prevention programs, to ‘Trauma’ management, among which prevention is the most prominent and vital. Furthermore, efforts are exerted to encourage the preventability of road traffic injuries and promote good practices related to helmet and seatbelt wearing, no drinking while driving, no speeding, and being visible in traffic. This paper elaborates on the importance of the primary care of the injured patients and more importantly, awareness and appropriate training of the health care providers. The purpose of this research is to assess the Lebanese healthcare providers’ knowledge and opinion on ‘Trauma’ education and training towards increasing the awareness of ‘Trauma’ care in Lebanon, improving the education of the health care providers and standardizing the management of ‘Trauma’ patients. A quantitative exploratory research is used utilizing a survey questionnaire as a basis for quantitative analysis using descriptive statistics and causal regression techniques. Research outcomes are to be used as a foundation for recommendations to the Lebanese public sector as well as to the private healthcare institutions so as to promote them to introduce better policies into ‘Trauma’ management principles, and guidelines for more effective practices.

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1. Introduction:

The last two decade witnessed extensive research on ‘Trauma’, showing that it is considered a leading cause of death worldwide. However, the World Health Organization (WHO) (2004) supports the fact that a better management of ‘Trauma’ patients leads to an increase in the survival rates and a decrease in morbidity and mortality. Moreover, this organization’s report in 2013 as cited by Rusli Bin (2014), states that “nearly 3,400 people die on the world’s roads every day, about 1.24 million people die each year, between 20 and 50 million sustain non-fatal injuries, and tens of millions of people are injured or disabled every year. The WHO predicts that road traffic injuries will rise to become the fifth leading cause of death by 2030” (Para 6). Furthermore, WHO (2013) reports that “half of the world’s road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (5%) – i.e. ‘vulnerable road users’ – with 31% of deaths among car occupants and the remaining 19% among unspecified road users” (p. 6).

This report promotes good practices related to helmet and seatbelt wearing, no drinking while driving, no speeding, and being visible in traffic. It enforces these policies through its work with partners -governmental and non-governmental- around the world to encourage the preventability of road traffic injuries. Consequently, WHO reports that “road safety legislation has been strengthened in 35 countries, representing almost 10% of the world’s population. These countries passed laws to address one or more key risk factors affecting road traffic injuries and fatalities – speed, drink-driving, motorcycle helmet use, seat-belts, and child restraints” (p. 12).

The magnitude of ‘Traumatic’ injury as a public health problem is enormous in terms of years of lost productive life, prolonged or permanent disability and cost; ‘Trauma’ injury is now being recognized as one of the most important threats to public health and safety all over the world (ACS-COT, 2001). As such, the prevention of traumatic injury and the provision of ‘Trauma’ care are regarded as public services central to the mission of public



health agencies (ibid). Mock, Abantanga, Goosen, Joshipura and Juillard (2009) support the issue of prevention and contend that “to decrease the burden of death and disability from injury, a spectrum of activities are needed, including injury surveillance, injury prevention and improvements in the care of the injured (e.g. ‘Trauma’ care). Obviously, a major emphasis should be on prevention. However, much can also be accomplished by improvements in ‘Trauma’ care” (p. 382).

In the broadest sense, the goal of a system of health care is to decrease the risks of the burden of health threats to individuals and to society. For a ‘Trauma’ system to achieve this goal, it requires a group of related injury-oriented facilities, personnel, and organizational entities who operate in an organized, coordinated manner, within a specific geographical area.

1.1. Need for a Systematic Approach to Trauma Management:

According to Eastman et al. (1991), Mendeloff and Cayten (1991) as cited in the National Academy of Sciences (1999), “a ‘Trauma’ care system is an organized and coordinated effort in a defined geographic area to deliver the full spectrum of care to an injured patient, from the time of the injury through transport to an acute care facility and to rehabilitative care. A ‘Trauma’ care system consists of three major providers—prehospital, acute care, and rehabilitation—that, when closely integrated, ensure a continuum of care” (Para 3). To reduce the burden of injury, WHO (2004) asserts that a spectrum of activities well beyond specialized ‘Trauma’ medical care is required, though the definitive treatment of life – or limb – threatening physical injury rests with the surgical specialty; however, the point of view that traumatic injury is purely a surgical problem has given way to a more system-based perspective. Furthermore, the United States of America Department of Transportation (2004) contends that “prevention activities could keep many from experiencing ‘Trauma’, and improved systems of care for the injured can increase the chances of optimal recovery. Regardless of the number of injured or the source of injury, advanced planning, preparation, and coordination are essential for optimal response and care” (p. 4).

‘Trauma’ system is described by the National Academies Press (2007) as “a coordinated approach to ‘Trauma’ care and injury prevention. Whereby, optimal care is delivered to injured patients when preconceived processes and resources are coordinated in an organizational plan. A well-organized ‘Trauma’ system allows patients to move seamlessly and expediently through the system. Almost all systems have standardized triage processes and constant oversight over ‘Trauma’ centers but may differ based on designation processes and criteria for inter-facility transfers” (Para 14).

‘Trauma’ cases are observed in other countries, and Lebanon is no exception. Data collected by the Lebanese

Red Cross (LRC), show that by the year 2008, “9,546 accidents” ended with death or injury leading to disability; this number is expected to increase. Nevertheless, there is overwhelming evidence that ‘Trauma’ services in Lebanon need to be dramatically improved, especially “with nearly 15 deaths per 100,000 people, Lebanon has a high road death rate, as compared to other countries of the world” (Choueiri, Choueiri and Choueiri, 2010, 7). In 2017, “LRC reports that the EMS Technicians carried out 21,347 emergency missions in February 2017, through its stations (46 stations) that are spread all over the Lebanese regions. There were 1,838 injuries caused by car accidents just in two months (January 982; February 856)” (Lebanese Red Cross, 2017).

Further, as per the opinion of the population and the available resources in the country, ‘Trauma’ patient care in Lebanon is unfortunately mediocre. ‘Trauma’ patients, especially the critical ones who need accurate and instantaneous management of their injuries, face the scarce resources within the Health Care settings; hence, they are the ones who face the highest chances of mortality and morbidity. In addition, according to Rogers and Rittenhouse (2014), “‘Trauma’ care must be initiated within 60 minutes, or the Golden Hour. The underlying tenet is that an injured patient has 60 minutes from the time of injury to receive definitive care, after which morbidity and mortality increase significantly” (p. 11). Consequently, good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care. The appropriate management of the ‘Trauma’ patients starts with the appropriate education of the health care providers about the international guidelines on and protocols for ‘Trauma’ care.

One Lebanese hospital recognized the urgent need for specialized ‘Trauma’ training, namely, The American University of Beirut Medical Center (AUBMC); it offers - through its teaching center – comprehensive healthcare services, extensive tertiary/quaternary resources, medical, nursing and paramedical training. It reinforces the mission of its teaching center which is “dedicated to the passionate pursuit of improving the health of the community in Lebanon and the region through the delivery of exceptional and comprehensive quality care to our patients, excellence in education and training, and leadership in innovative research” (American University of Beirut Medical Center – AUBMC, 2017, p. 3).

Furthermore, as the leading academic medical center in the region, AUBMC “offers training and education to healthcare providers through its Continuing Medical Education (CME) Office, Clinical and Professional Development Center (CPDC), and External Medical Affairs (EMA) Office. Established in 2010, AUBMC’s CME Office organizes courses and trainings on kidney transplantation, multiple sclerosis, cardiovascular diseases, biomedical ethics, Advanced Trauma Life Support (ATLS), nursing, and health informatics” (ibid, p.



17). Also, the American University of Beirut – Continuing Education Center, has the resources, capabilities and willingness to teach “Basic Trauma Life Support (BTLS)”, “Major Incident Medical Management and Support (MIMMS), and the Advanced Trauma Care for Nurses (ATCN®)” Programs in Lebanon (American University of Beirut – AUB, 2017, Para 6).

This paper elaborates on the importance of the care of the injured patients and more importantly, awareness and appropriate training of the health care providers. It aims at assessing the level of knowledge related to ‘Trauma’ education of the healthcare providers in Lebanon, as well as exploring the Lebanese Healthcare providers’ opinion about ‘Trauma’ education.

1.3. Research Objectives:

The objectives of the research are to:

- a. Emphasize the importance of “‘Trauma’ Management’
- b. Assess the effect of “‘Trauma’ Management’ on improving the outcome of victims of ‘Trauma’
- c. Expose the opinion of experts in the field of ‘Trauma’ in regards to ‘Trauma’ Education and ‘Trauma’ Management
- d. Assess the Lebanese healthcare providers’ knowledge of ‘Trauma’ Management
- e. Study the attitude of Lebanese healthcare providers toward ‘Trauma’ Education

2. Literature Review:

There are several definitions of ‘Trauma’ based on the perspective it is viewed from. For example, Giller (1999), President of Sidran Institute for Traumatic Stress Education and Advocacy, contends that “the word ‘Trauma’ in everyday language to mean a highly stressful event. But the key to understanding traumatic events is that it refers to extreme stress that overwhelms a person’s ability to cope” (Para 1). According to Kathleen Wilbur (2002), Michigan Statewide Trauma Care Commission, “The American Trauma Society defines ‘Trauma’ as an injury caused by a physical force. More often, ‘Trauma’ is the consequence of motor vehicle crashes, falls, drowning, gunshots, fires and burns, stabbings, or blunt assaults. The American College of Surgeons Committee on Trauma explains ‘Trauma’ as a bodily injury that may encompass a large range of severity. The current view of ‘Trauma’, according to the Committee, has focused primarily on those injuries severe enough to cause death or disability. This Committee has always believed that ‘Trauma’ is a surgical disease that demands surgical leadership in planning, development, and maintenance of a ‘Trauma’ care system” (p. 10). Well-known dictionaries provide similar definitions; Merriam-Webster dictionary (2017) defines ‘Trauma’ as, “an injury (such as a wound) to living tissue caused by an extrinsic agent; or is a disordered psychic or behavioral state resulting from severe mental or emotional stress or physical injury; or is an emotional upset” (Para 1).

While the Free Dictionary (2017) defines trauma as, serious injury to the body, as from physical violence or an accident; or severe emotional or mental distress caused by an experience; or an experience that causes severe anxiety or emotional distress; or an event or situation that causes great disruption or suffering” (Para 1).

The National Child Traumatic Stress Network (2008) defines ‘Trauma’ as “being an unintentional injury or accident such as car accident, house fire, serious playground injury, or accidental fall down stairs” (p. 2). While Martin and Meredith (2008) contend that “Trauma is mechanical damage to the body caused by an external force” (p. 1). Moreover, the World Health Organization (WHO) and the United States of America Department of Transportation: National Highway Traffic Safety Administration define ‘Trauma’ “as being a ‘disease’ which accounts for a significant proportion of the world’s burden” (US Department of Transportation, 2004, p. 4; Lashoher et al., 2016, Para. 1).

Worldwide injuries kill 5.8 million people yearly, which accounts for 9% of all global deaths. More than 40 million disability adjusted life years (DALYs) are lost as a result of violence. Up to 70% of women in some countries have experienced some form of violence. Nearly 9% of deaths due to injuries (intentional and unintentional) occur in low- to middle-income countries. In many countries people who use bicycles, motorcycles, or are pedestrians account for up to 80% of all road traffic deaths (Mahendra, Roehler and Degutis, 2012).

The aforementioned injury-induced conditions create enormous demand for medical care and rehabilitation services. In this research, the interest is directed to ‘Trauma’ as being an injury induced to the body, and a disease that can be prevented or managed in a way that reduces the severity and improves outcome. The words “injury” and ‘Trauma’ are used interchangeably throughout the document.

2.1. Trauma Education and Trauma Programs:

Stephen Deane, President of the International Association for the Surgery of Trauma and Surgical Intensive Care (IATSIC), asserts that “for too long, ‘Trauma’ has been one of the leading health problems in the world” (2004, p. vii); furthermore a ‘Trauma’ patient is “an injured person who requires timely diagnosis and treatment of actual or potential injuries by a multidisciplinary team of health care professionals, supported by the appropriate resources, to diminish or eliminate the risk of death or permanent disability” (Martin and Meredith, 2008, p. 1). To accomplish the aforementioned objective, organized approaches to ‘Trauma’ prevention and treatment are needed, and resources are essential to the success of injury prevention and treatment (Mock, Lormand, Goosen, Joshipura and Peden, 2004, p. 3).



In terms of treatment, there are many low-cost improvements that could be made to enhance the care of injured persons or 'Trauma' patients; in addition, it is essential to improve road safety and other aspects of injury prevention, and efforts are to be made towards improving the care of the injured.

Accordingly, decreasing the burden of death and disability from injury, a spectrum of activities need to be considered, including surveillance and basic research, prevention programs, 'Trauma' management and treatment. Moreover, to activate the aforementioned actions, support is needed for making available the needed resources, including human and physical resources.

The former have to be highly aware of what 'Trauma' entails and the procedures needed to deal with it; they should be well selected and trained. The physical resources include supplies and equipment; in fact, both prevention and treatment lead to major gains.

Deane (2004) contends that "the life- and limb-threatening injuries, which are daily parts of 'Trauma' care, present some of the most difficult decisions that any clinician can face. However, many lives can be saved through inexpensive modifications of education, organization, and availability of simple pieces of equipment. Such changes greatly simplify decisions and actions" (p. vii). In fact, many international programs have been developed to standardize the 'Trauma care'. Exhibit 1 is a brief summary of current 'Trauma' education programs.

Exhibit 1. Trauma Education Programs

(1) The Advanced Trauma Life Support (ATLS)

The ATLS program presents a systematic, concise approach to the care of a 'Trauma' patient. ATLS was developed by the American College of Surgeons (ACS) Committee on Trauma (COT) and was first introduced in the US and abroad in 1980. Its courses provide the trainees with a safe and reliable method for immediate management of injured patients. The course teaches how to assess a patient's condition, resuscitate and stabilize him/her, and determine if patient's needs exceed a facility's capacity. It also instructs on how to arrange for a patient's inter-hospital transfer and assure that optimum care is provided throughout the process. If you don't treat patients frequently, an ATLS course provides an easy method to remember for evaluation and treatment of a 'Trauma' victim (ACS, 2017, Para 1).

(2) The Advanced 'Trauma' Care for Nurses (ATCN®)

ATCN course was developed for nurses in response to a need for advanced 'Trauma' education. It has been operational in the United States since 1984. In 2000, the ATCN program was incorporated under the auspices of the Society of Trauma Nurses (STN). STN is a professional, international nursing organization that

spans the continuum of 'Trauma' care. The ATCN course is taught concurrently with approved Advanced Trauma Life Support (ATLS) courses. The ATCN course includes an educational model that promotes critical thinking processes, collaborative, synchronized team approach to 'Trauma' care with the students of the simultaneous ATLS course. Physicians and nurses who care for 'Trauma' patients have the opportunity to share a common language and approach to 'Trauma' care.

The nurses related ATCN stations are: Interactive Skill Stations: Initial Assessment & Management, Airway and Ventilatory Management, Hemorrhagic Shock, Pediatric Trauma, Head Trauma, Musculoskeletal and Spinal Trauma, Review Stations, ATCN Pretest Review, ATCN Triage Scenario Discussion, Med Teams Video Discussion. Testing Stations: Initial Assessment & Management (Practice & Testing) Stations, Written Exam. These ATCN skill stations are based on an interactive "hands-on", scenario-based approach to promote critical thinking using adult education principles. The practical testing stations allow the ATCN students to demonstrate the application of ATLS and ATCN information on a 'moulage' patient (Advanced Trauma Care for Nurses – ATCN, 2014, p. 1)

(3) The Pre-Hospital Trauma Life Support (PHTLS)

PHTLS is recognized around the world as the leading continuing education program for prehospital emergency 'Trauma' care. It promotes excellence in 'Trauma' patient management by all providers involved in the delivery of prehospital care through global education. PHTLS is developed by NAEMT in cooperation with the American College of Surgeons' Committee on Trauma. The Committee provides the medical direction and content oversight for the PHTLS program.

PHTLS courses improve the quality of 'Trauma' care in the applied area and decrease mortality. The program is based on a prehospital 'Trauma' care philosophy, stressing the treatment of the multi-system 'Trauma' patient as a unique entity with specific needs. PHTLS promotes critical thinking as the foundation for providing quality care. It is based on the belief that, given a good fund of knowledge and key principles, EMS practitioners are capable of making reasoned decisions regarding patient care (National Association of Emergency Medical Technicians- NAEMT, 2017).

The three courses (Exhibit 1) are utilized worldwide to standardize 'Trauma' care. Many others have been developed in Europe, most of which are based on the aforementioned American guidelines. However, these three courses, in addition to being internationally known, have shown by Evidence Based Practice to be the most efficient and the most effective in the care of 'Trauma' Patients'.



2.3. 'Trauma' Worldwide and in Lebanon:

Around 1.2 million people worldwide are estimated to be killed and 50 million injured in road traffic accidents each year. Statistics reveal that every 3 minutes a child is killed on the world's roads, and more than 80% of road deaths occur in low- and middle-income countries (Choueiri et al., 2010). According to some estimates, it is expected that, in the year 2020: "Road deaths will increase by 80%, Deaths and injuries due to road traffic will rise by 65%; and, Deaths and injuries due to road traffic will see a reduction of 28% in high-income countries, compared to an increase of those incurred in low- and middle-income countries due to escalating motorization" (Choueiri et al., 2010, p. 1).

Choueiri et al. (2010) assert that "driving in Lebanon can be an adventure. Motorists here are constantly the victim - and perpetrator - of careless, over-aggressive, and inattentive driving (the latter often linked to the constant use of the mobile phone). Other bloody-minded behavior includes driving against the flow of traffic, excessive use of the horn, and a fabulously cavalier approach to parking" (p. 3). Furthermore, the authors enumerate several mishaps pertaining to Lebanese drivers as depicted in Exhibit 2.

Exhibit 2. Mishaps of Lebanese drivers

- (1) The majority of drivers in Lebanon lack a proper traffic education,
- (2) They possess a driver's license but without having ever been subjected to a proper driving test on the roads,
- (3) Do not undergo strict medical supervision and mandatory periodic examination of their eyesight and health.
- (4) Lebanese roads are badly maintained and poorly designed.
- (5) Agitation and frustration, and various deliberate obstructions, obscene gestures and verbal abuse are commonplace. This, in turn, spawns incidents ranging from often extreme acts of aggression, physical assault to - of course - road traffic accidents.

Source: Choueiri et al., 2010, p. 3.

Due to the existence of considerable discrepancies in the collection of road-traffic accidents' statistics in Lebanon, between those collected by the police and the ones assembled by the Lebanese Red Cross or any other entities, there are no accurate data pertaining to 'Trauma' injuries in Lebanon. However, the Lebanese Red Cross – Emergency Medical Services (LRCEMS) could be good reliable sources. Table 1 shows data summarizing 'Trauma' injuries for the years 2014 and 2015. The data collected is distributed under the categories of Accidents, Injuries, and Deaths; and, the types of accidents are car accidents, motorcycle accidents, pedestrian accidents and others. Others include, but are not limited to, industrial accidents, falls, accidents on snow, alterations... etc.

Table 1. Summary of 'Trauma' incidents as per LRCEMS 2014-2015

	2014	2015
Accidents	9458	10866
Injuries	12076	14516
Deaths	143	229
Type of Accidents		
Car accidents	56%	59%
Motorbikes	28%	26%
Pedestrians	14%	13%
Others	2%	2%

Source: Lebanese Red Cross Emergency Medical Services (Beirut Headquarters, personal communication, March 25, 2016).

As shown in Table 1, the total number of accidents has increased, from 2014 to 2015, by 14.89%: Injuries increased by 20% and deaths increased by 60%. These results are dramatically frightening. Taking into consideration that they are collected from one source only, not having any other data from the Civil Defense, Ministry of Health or any national registrar, one can assume that the numbers are in reality much higher. Moreover, the increase in these numbers shows that the lack of available protocols and prevention plans may lead to an increase in the numbers of 'Trauma' incidents in Lebanon.

2.4. Status of 'Trauma' – Mortality and Morbidity:

The Institute of Health Management and Social Protection (IGSPS) (2012), reports that "in 2010, the mortality rate in Lebanon was 5.4/1000. This rate has been rather stable since 2006. The declared and registered deaths reached 21,441 in 2010. These figures were taken from the registry of the Ministry of the Interior and included deaths of Lebanese citizens in Lebanon and abroad. On average, deaths are declared with a 1-year delay and death certificates are often incomplete. The highest death rate is found in Beirut (the Capital), followed by Nabatiyeh (South of Lebanon); whereas Mount Lebanon has the lowest rate" (p. 50).

In addition, IGSPS adds, "Cardiac arrests are the most frequent causes of death. However, in a hospital-based survey conducted by the Ministry of Public Health in 2010-2011 on causes of mortality, the main cause of death was linked to circulatory system diseases (22%), followed by neoplasm (19%) and cardiac arrests (17%). Furthermore, mortality due to HIV and tuberculosis (1.5/100,000) and H1N1 (0.1/100,000) is low. Thirteen percent (13%) of accidents resulting from burns lead to death. Morbidity among accident victims is higher for men (77%) and for those between 18 and 34 years of age" (IGSPS, 2012).

The World Health Organization – WHO (2013) contends that "approximately 1.24 million people die every year on the world's roads, and another 20 to 50 million sustain non-fatal injuries as a result of road traffic crashes. Road traffic injuries are estimated to be the eighth leading



cause of death globally” (p. 1). Furthermore, WHO reports that “the overall global road traffic fatality rate is 18 per 100,000 of the population. However, middle-income countries have the highest annual road traffic fatality rates, at 20.1 per 100,000, while the rate in high-income countries is lowest, at 8.7 per 100,000. Eighty percent of road traffic deaths occur in middle-income countries, which account for 72% of the world’s population, but only 52% of the world’s registered vehicles. This indicates that these countries bear a disproportionately high burden of road traffic deaths relative to their level of motorization” (p. 4).

Furthermore, the National Trauma Institute (2017) reports that ‘Trauma’ is the number one cause of death for Americans between 1 and 46 years old, and is the number 3 cause of death overall. Also, each year, ‘Trauma’ accounts for 41 million Emergency Room (ER) visits and 2 million hospital admissions. ‘Trauma’ injury accounts for 30% of years lost in life. Finally, each year, more than 192,000 people lose their lives to ‘Trauma’.

Assessing the extent of road accidents in Lebanon is problematic in the absence of reliable statistics, and due to the neglect to declare all the accidents resulting in death or injury. “Death due to road accidents are defined in Lebanon as those taking place on the accident site, whereas internationally, death due to road accidents are defined as those resulting up to 30 days after the accident. Furthermore, accidents occurring with army vehicles are not accounted for in this data. Also, accidents with only material damages are not included; these are evaluated at 100,000 cases.

The Lebanese Red Cross and “Kunhadi”, a local NGO, estimate the number of road accidents in 2011 at approximately 11161 cases. This figure only reflects cases necessitating the intervention of first-aid units. The figures put forward by the Internal Security Forces (ISF) for 2010 are generally lower (4583) as they include only those accidents where the ISF have been called on-site; this happens in the case of the need to compile a police report, or if there is a need of hospitalization or death” (The Institute of Health Management and Social Protection - IGSPS, 2012, p. 60).

2.5. Cost of ‘Trauma’:

Developing countries bear a large share of the burden of developing mitigation strategies to reduce annual deaths due to accidents which account for 85 percent of annual deaths and 90 percent of the disability-adjusted life years (DALYs) lost because of road-traffic injury. In addition, since road-traffic injuries mainly affect males (73 percent of deaths), and those between 15 and 44 years old, this burden is creating enormous economic hardship due to the loss of family’s main breadwinners. Moreover, the disability burden for this age group accounts for 60 percent of all DALYs lost. The costs and consequences of these losses are significant. Three-quarters of all poor families who lost a member to road-traffic accidents reported a

decrease in their standard of living, and 61 percent reported that following their loss they had to borrow money to cover the expenses. The World Bank estimates that road-traffic injuries cost 1 to 2 percent of the Gross National Product (GNP) of developing countries, or twice the total amount of development aid received worldwide by these countries (Worley, 2006).

Uncompensated care is a problem in most of the cities of the world where ‘Trauma’ Systems are in place. Hospitals are obliged to care for the ‘Trauma’ patients and then find ways to refund their expenses. The cost of providing uncompensated ‘Trauma’ care at Texas hospitals is now estimated to be more than \$309 million annually, and is on the increase (Kroll, 2016).

To find a solution to the uncompensated care, Texas, among other American states, implement “The Driver Responsibility Program” which requires drivers with a specific number of points on their licenses to pay additional fines for traffic violations. These funds go to hospitals with a designated ‘Trauma’ center for uncompensated care. These funds have been a significant help in offsetting a portion of uncompensated ‘Trauma’ care in ‘Trauma’ centers all across Texas (Diehl, 2016).

The cost of road traffic accidents results in a significant loss of productive days for workers and in a significant loss of income for the families of the victims. Furthermore, though it is beyond the scope of this study to tackle the cost issue, it is nonetheless important to know that the victims of road-traffic accidents in Lebanon spend an average of 1.76 days in the hospital with an average cost of \$600 per day (Choueiri at al., 2010). That is, every injury costs an average of \$1,056. Unofficially available statistics in Lebanon place the number of injuries from road-traffic accidents at around 3,400 per year (in the year 2010). A simple calculation would then indicate that the direct medical cost of treating road-traffic injuries is about 3.6 million U.S. dollars per year. As mentioned earlier, the economic cost of road-traffic accidents is estimated by international sources to be at 1.5% of the Gross National Product (GNP), or 240 million U.S. Dollars; this poses a significant financial burden on the economy of a country where a sizeable portion of the population lives below the poverty line at less than \$2 per day (Choueiri at al., 2010).

2.6. Comparison with Other Countries:

One of the leading causes of death and disability in the Middle East is road-traffic injuries. The World Health Organization estimates that by 2020 road-traffic injuries will be the third leading cause of disability adjusted years of life lost worldwide (Murray & Lopez, 1996). Moreover, analyses of the International Road Federation’s world road statistics show that five countries in the Middle East are among the countries that have the highest road traffic death rates in the world: United Arab Emirates, Oman, Saudi Arabia, Qatar and Kuwait; all had more than 18 deaths per 100,000 people in 2000. As to Lebanon, with nearly 15



deaths per 100,000 people, it has a high road-death rate as compared to other countries of the world (International Road Federation, 2005).

Death rates are higher in countries with more cars per 100,000 people (ibid). As the countries of the Middle East motorize, their death rates will inevitably rise. Investigators in Middle Eastern countries should identify interventions to lower the death toll from traffic fatalities (Peden et al., 2004).

2.7. 'Trauma' Prevention:

'Trauma' injury, both unintentional and intentional, is the leading cause of death in the first four decades of life, accounting for millions of dollars and disability costs. The treatment is to prevent injury or death from occurring (Kochanek, Murphy, Xu and Tejada-Vera, 2016). Many prevention programs have been developed to serve the community with the purpose to mitigate accidents. Some programs that fit the aforementioned purpose include Youthful Driving and Drinking Prevention Programs and Outreach Programs; these are 'Trauma' level one centers that try to reach out all people in schools, jails, streets, etc..., to educate and raise awareness of 'Trauma' and its consequences. Advanced countries, like the United States of America, have even developed state advisory councils to stress the importance of prevention and, at the same time, create awareness among the public. One good example is The North Central Texas Trauma Regional Advisory Council's (NCTTRAC), whose philosophy states: "we believe that the majority of injuries are preventable and that planned prevention strategies will result in decreased morbidity and mortality related to injury" (NCTTRAC, 2010, p. 4).

NCTTRAC also believes that resources are limited and that coordinated distribution and utilization of resources will result in the safest and most effective 'Trauma' Service Area in Texas. They also believe that 'Trauma' care providers, through organized education and training, can be trained to deliver optimal 'Trauma' care based on best evidence (NCTTRAC, 2010, p. 4).

2.8. Encouraging the Public Role:

The Governor's EMS and Trauma Advisory Council - GETAC (2015) asserts that public education focuses on encouraging the public's role, being a key partner in 'Trauma' system. Demonstrating access to the system and the capability of local health care entities allows citizens to understand that choices and personal responsibility regarding injury prevention can directly influence their lives and the lives of their loved ones. "Public education should ultimately lead to better utilization of 'Trauma' system resources and improved patient outcomes" (GETAC, 2015, p. 25).

In general, all states in the US are known for their collaboration with the healthcare centers to enforce legislations so as to increase patient outcomes and

introduce a better prevention of 'Trauma' program. Patient outcomes represent quality care measurements. According to Bird (2016), "the Centers for Medicare & Medicaid Services (CMS) grouped quality measures in seven categories, weighted by importance: Mortality, 22%; safety of care, 22%; readmissions, 22%; patient experience, 22%; effectiveness of care, 4%; timeliness of care, 4%; and efficient use of medical imaging, 4%" (Para 3).

In Lebanon, the Ministry of Public Health has established with the World Health Organization (WHO) six programs to enhance quality care; these are: National AIDS Program (NAP); Tuberculosis Program (TB); Non-communicable Disease Program – NCDP (among which the National Program on controlling Diabetes); National Program on controlling Viral Hepatitis; Injuries and Accidents Program; and, Drug Registration and Control Program (IGSPS, 2012, pp. 114-115). However, in regards to the injuries and accidents program, efficiency level of 'Trauma' care is yet to be determined.

The Lebanese Government's determination to contain expenses and offer equitable, effective and efficient services constitutes a key element in the aforementioned quality care process toward 'Trauma' system. However, these procedures alone do not seem sufficient. Major changes in people's mentalities and new practices are necessary to confront the various challenges facing the 'Trauma' system.

2.9. Need for 'Trauma' Awareness and Education in Lebanon:

Almost three decades of research have consistently suggested that in-hospital (and post-discharge) mortality rates are reduced by 20 to 25% among severely injured patients treated in 'Trauma' centers that are incorporated into a regional or statewide 'Trauma' system. Nevertheless, much of the work on the effectiveness of 'Trauma' system (center) development has been hampered by the lack of consistent, quality data that demonstrate the differences in mortality rate over time or between hospitals, regions, or states (ACS NTDB, 2013).

It is worth noting that hospital-based 'Trauma' registries are the basis for much of the research and quality assessment work that has informed clinicians and policy makers about methods that would optimize the care of injured patients (ACS NTDB, 2013).

However, due to the lack of consistent data in Lebanon, one cannot amplify and illustrate the importance and the need of 'Trauma' awareness and education and the need of establishing appropriate systems.

2.10. Components:

The components of an appropriate 'Trauma' training center are many. Herein the "needs of the injured patient" are delineated in Exhibit 3, as defined by the guidelines on 'Trauma' care by the WHO (Mock et al., 2004).



Exhibit 3. Guidelines on 'Trauma' care by the WHO

Human Resources: Staffing and Training

There is a need to optimize the training of medical and nursing staff who take care of injured patients. This applies to both urban and rural environments. Inexpensive, but effective, solutions might include:

- i. Countrywide plans to encourage those staff with more experience in 'Trauma' care to go to 'Trauma' care hospitals
- ii. Provision of continuing education courses on 'Trauma' care for general practitioners (GPs) and nurses in high-volume 'Trauma' (*higher patient volumes*) hospitals.

Pilot programs for such training have demonstrated improvements in 'Trauma' care within a variety of environments, including Ghana and Trinidad.

Physical Resources; Infrastructure, Equipment and Supplies

Many hospitals lack important equipment, some of which is inexpensive. For example, chest tubes and emergency airway equipment. These items are vitally important for the treatment of life-threatening chest injuries and airway obstruction, which are major preventable causes of death of 'Trauma' patients. Such equipment is inexpensive and much of it is reusable. The main reason for the absence of such vital equipment is lack of organization and planning, rather than resource restrictions

Process Organization and Administration

In addition to assuring adequate supplies, improved administration could also assist in appropriate utilization. Studies have shown that prolonged times to emergency surgery were noted to be due to lack of utilization of appropriate equipment even if such equipment is available. Moreover, lack of policies and protocols issued by the administration reinforced this behavior and increased the risks to the lives of the injured.

Source: Mock, Lormand, Goosen, Joshipura and Peden, 2004, pp. 4-5.

2.11 Standardized and Known Goals to be achieved:

According to Mock et al. (2004), the services which are essential to prevent death and disability of injured patients can be categorized into three broad sets of conditions that are to be applied to meet the needs of the patient:

1. "Life-threatening injuries are appropriately treated, promptly and in accordance with appropriate priorities to maximize the likelihood of survival.
2. Potentially disabling injuries are treated appropriately to minimize functional impairment and to maximize the return to independence and participate in community life.
3. Pain and psychological suffering are minimized" (p. 11).

Furthermore, Mock et al. posit that within the aforementioned three broad categories, there are several specific medical goals that are eminently achievable within the resources available in most countries. These are delineated in Exhibit 4.

Exhibit 4. Achievable medical goals provided that 'Trauma' services are available

- Obstructed airways are opened and maintained before hypoxia leads to death or permanent disability.
- Impaired breathing is supported until the injured person is able to breathe adequately without assistance.
- Pneumothorax and hemothorax are promptly recognized and relieved.
- Bleeding (external or internal) is promptly stopped.
- Shock is recognized and treated with an intravenous (IV) fluid replacement before irreversible consequences occur.
- The consequences of traumatic brain injury are lessened by timely decompression of space occupying lesions and by prevention of secondary brain injury.
- Intestinal and other abdominal injuries are promptly recognized and repaired.
- Potentially disabling extremity injuries are corrected.
- Potentially unstable spinal cord injuries are recognized and managed appropriately, including early immobilization.
- The consequences to the individual of injuries that result in physical impairment are minimized by appropriate rehabilitative services.
- Medications for the above services and for the minimization of pain are readily available when needed.

Source: Mock et al., 2004, pp. 11-12.

Furthermore, Mock et al. contend that "the precise procedures that can optimally be applied to achieve these goals, as well as the human and physical resources needed to optimally carry out these procedures, will vary across the spectrum of economic resources of the nations of the world and the geographic location of the facilities concerned. However, these goals should be achievable for most injured patients in most locations" (p. 12).

2.12 Advantages of 'Trauma' Training:

A central theme of the 'Trauma' training is that improved outcomes for injured patients can be achieved through better organization and planning of 'Trauma' care services (WHO, 2004).

In addition, 'Trauma' training enables the health care workers to give 'Trauma' patients the gift of survival and health to those individuals who have lost all hope; such



training has proven to be advantageous. Some of these advantages are stated herein:

- i. Reduce disparities by establishing achievable and affordable standards for injury care as per the international guidelines
- ii. Trained staff can 'make a unique contribution to the care of multiply injured patients by expanding their wider roles in the context of 'Trauma' care'
- iii. Trained staff can play a key role in communication and support, which can, in turn, contribute to the patient's experience and outcome
- iv. Trained staff can also ensure good communication within the 'Trauma' team and provide psychological support to patients
- v. Trained staff can play a crucial role in decreasing mortality and morbidity by 'Trauma' taking courses intended to help nurses recognize and prevent physiological deterioration and cardiac arrest in patients, such as the Acute Life Threatening Events, Recognition, and Treatment (ALERT)
- vi. 'Trauma' training improves emergency staff's performance
- vii. Trained people limit patients' costs and ensure staff accessibility; they can use local facilities and minimal equipment.

2.13 Barriers:

Barriers to 'Trauma' education are different in each country. It has been noted that high-income countries have less or no barriers to 'Trauma' education since these countries are considered leaders in 'Trauma' management and 'Trauma' awareness; they are the countries where 'Trauma' education and systems are mandatory. The barriers to 'Trauma' education are noted in low privileged countries and that is because of many factors, mainly:

- i. Socio-Economic barriers: 'Trauma' programs have a high cost for initiation and maintenance.
- ii. Lack of access to basic services: Countries that have difficulty in providing the basic services in health to its population have low or no interest in 'Trauma'
- iii. Poverty and underdevelopment
- iv. Attitudes: Attitudes of the health care providers who are resistant to acquiring new knowledge and skills regarding 'Trauma'
- v. Language and communication: Programs established so far are in English. Countries where English is not practiced have a problem in establishing these programs
- vi. Inaccessibility: Sometimes the 'Trauma' programs are present in one country but are focused and accessible to urban regions whereas rural areas have no such privilege
- vii. Lack of enabling and protective legislation and policy: Ministries of health and laws should back up the 'Trauma' system in their respective countries. Lack of legislation does not facilitate the implementation of the international guidelines throughout a country; this causes a

major barrier to the promulgation of the 'Trauma' educational programs.

2.14 Demographic and Health Sector Analysis:

According to the World Health Organization (WHO) statistical report on Lebanon for the year 2013 "the population in Lebanon is about 4,822,000, with an average age of 30 years old, and 88% residing in urban areas" (p. 152). Furthermore, Lebanon's population has grown at an average rate of 1.6%, over the past 2 decades (MOPH, 2013, p. 3). Moreover, the Ministry of Public Health (MOPH) in Lebanon reports that "46.6% of the population resides in Lebanon's middle regions (Beirut and Mount Lebanon), the rest are distributed across the North (21%), the South (18.7%) and the Bekaa (13.7%)" (MOPH, 2013, p. 9).

A sizable proportion of the total Lebanese population (68.10%) is in the active age category, i.e. within the age range of 15 to 64 years (MOPH, 2013, p. 9). This category is highly prone to injury due to physiologic changes that occur with age, and affect patients in a number of ways, such as falling down due to physical impairments, and youth injuries associated with participation in sports; however, car accidents that are mainly due to excessive speeding raise road-traffic deaths and injuries by 65%. It is worth noting that there is an international growing recognition of this major public health challenge, including in Lebanon. However, in order to offer full support to hospitalized 'Trauma' injured, Lebanese hospitals have to be ready especially in terms of resources; more specifically with beds. Concurrently with the aforementioned statistics, there is a need to be apprised of the availability of hospital beds that are available to 'Trauma' patients. Banque BEMO (2013) reports that "there is a total of 163 hospitals contracting with the Ministry of Public Health, 84.66% of the hospitals are private hospitals while 15% are public hospitals" (p. 14).

Further, "the supply of beds in Lebanon has been balanced since 2005; the number of beds available per 1000 individuals was maintained between 3.43 and 3.60. Currently, the number of hospital beds available in Lebanon is estimated around 14864 beds, i.e. a ratio of 3.5 beds per 1000 individuals" (p. 16). On the other hand, according to Marcopolis (2012), "one of the largest public hospitals in Lebanon, with a capacity of 450 beds is located in Beirut. The largest private hospital on the other hand is the American University of Beirut Medical Centre" (Para 4). For the sake of clarity, Table 2 shows the distribution of hospitals by number of beds.

Table 2. *Distribution of Hospitals by Number of Beds:*

Number of Beds	Public Hospitals	Private Hospitals
Up to 70 beds	14	96
71 to 200 beds	6	43
Over 200 beds	0	4



Medium-sized hospitals have a capacity of around 75 beds and some are specialized hospitals with 25 to 30 beds. Besides, the secondary and tertiary hospitals, which are utilized for a short or medium term stay, are used for patients with chronic diseases, psychiatric cases and care for elderly. In addition to the above, positive hospital relationship with government leads to improved financial health care support. Therefore, another resource to support the care for 'Trauma' patients is government support that would cover financial obligations to the treating hospitals via The National Social Security Fund (NSSF).

The National Social Security Fund (NSSF) covers about 40% of the Lebanese population. The remaining are covered either by health scheme pertaining to the Armed Forces (Internal Security Forces) or by a health scheme which is called 'Cooperative of Public Employees' for public servants. Private health insurance does exist; however, it is not yet well developed and covers only about 12% of total population. The rest of the population of 1.5 million do not have this kind of health insurance, but are covered up to 85% by the Ministry of Public Health for treatments in a public hospital.

To compare Lebanon to surrounding countries, considering both the human resources and medical supplies, people from surrounding countries do prefer to come to Lebanon for medical treatment. First, because of the quality, and second, they gain so many advantages: moderate weather condition which is important to patients, language, accommodation and availability for those accompanied by family and relatives; all these are extras which are important advantages to patients coming from the Gulf and the MENA region as a whole.

Lebanese human resources hold a well-advanced level as compared to all neighboring countries. Lebanon has good universities and good medical staff. Lebanon graduates doctors, registered nurses, laboratory technicians, biomedical engineers, businessmen, etc ... So, Lebanon has leading edge human resources as compared to others.

3. Research Methodology:

Research philosophy is the way to go about doing a research (Hejase and Hejase, 2013, p. 77). This research follows a positivist philosophy, and adopts a deductive approach that depends on quantifiable observations that lead themselves to statistical analysis (Goddard and Melville, 2004; Crowther and Lancaster, 2008). The aforementioned statement is supported by Collins (2010) who notes that "positivism is in accordance with the empiricist view that knowledge stems from human experience. It has an atomistic, ontological view of the world as comprising discrete, observable elements and events that interact in an observable, determined and regular manner" (p. 38). On the other hand, Mkahal, (2016) discerns that researchers, who assume a positivist approach in their study, are independent and maintain

minimal interaction with their research participants when carrying out their research.

Since the research is based on concepts to be tested, and since the data on this subject is not available in Lebanon, the researchers opted to follow an exploratory, comparative and deductive approach. On the other hand, the research strategy is how the researcher intends to carry out the work (Saunders et al., 2007). The strategy adopted by the researchers follows the survey questionnaire approach. In point of fact, the adoption of a survey questionnaire allows the collection of a large amount of data from a sizeable population; the data is then analyzed quantitatively using descriptive and inferential statistics (Saunders et al., 2007).

3.1. Survey Questionnaire Design:

This research is conducted using a simple structured questionnaire that consists of 40 questions distributed among 5 sections that cover the respondents' knowledge of 'Trauma', the attitude of the respondents to 'Trauma', usefulness of 'Trauma' education, assessment of issues concerning implementation of 'Trauma' education, and demographical questions. Survey questions are dyadic, multiple choice and five-level Likert scale. One final question is an open-ended question designed to motivate respondents to add to the questionnaire any remarks that have not been discussed. The survey's five sections are

- (1) The first section is composed of eighteen questions that assess respondents' knowledge of the main topic or 'Trauma', including readiness, training, experience, applicability, and practices.
- (2) The second section is composed of seven questions regarding attitude of personnel and institutions to the different approaches to 'Trauma'.
- (3) The third section consists of another seven questions regarding attitude toward 'Trauma' education.
- (4) The fourth section consists of three questions that assess concerns.
- (5) Finally, the fifth section is about the respondents' demographics including age, gender, educational degree earned, and job sector.

3.2 Sample Size:

Primary data is needed in this research to assess the planned concepts. The data has been collected over a period of two years (2013-2015). 500 questionnaires were distributed to personnel from different departments, different backgrounds and years of experience. Respondents consist of healthcare providers, namely, nurses, doctors, and, paramedics who work in several hospitals' medical centers. The total number of acceptable questionnaires is 341. 102 questionnaires were not returned, 57 questionnaires were incomplete or wrongly filled. Therefore, the response rate is 68%, which is an acceptable percentage for such a study.



3.3 Concept to be assessed:

1. Lebanese healthcare providers are aware of effects of 'Trauma' Education.
2. Lebanese healthcare providers are aware of the importance of 'Trauma' Management.
3. Lebanese healthcare providers are aware of the effect of 'Trauma' Management on improving the outcome of victims of 'Trauma'.
4. Lebanese healthcare providers are aware of 'Trauma' Education for the betterment of 'Trauma' management.
5. Lebanese healthcare providers have a positive attitude toward 'Trauma' Education.

3.4 Data Analysis:

All responses were entered into the SPSS version 23 program "Statistical Product and Service Solutions, an IBM product acquired by IBM in 2009 (Hejase & Hejase, 2013, p. 58). The study was performed using exploratory statistics; data tables including frequency and percentage distributions and supported by selective figures. Moreover, cross tabs and regression analysis were performed to study relationships between variables that may add value to the findings of the research.

4. Results and Findings:

4.1. Descriptive Statistics:

4.1.1. Demographic Data:

Respondents are 35.6% females and 64.4% males. As for respondents' age, their mean average age is 27 years; they are split into four groups: 72.4% for the range 21 to 30 years old, 16.3% for 31 to 40 range, 4.3% for less than 20, and 7.1% for older than 40 years. Also, 21.4% of the respondents hold an MBA degree, 45.3% hold a bachelor degree, 23.9% hold a doctorate, and 9.5% are high school graduates. In addition, results show that respondents work in the following fields: 25.1% in Emergency Medical Services (EMS); 19.6% in Nursing; 15.3% in Surgery; 15.0% in Medicine; 1.5% in Medicine and EMS; 2.1% in Nursing and EMS; and, the remaining 21.4% are volunteers in the Lebanese Red Cross with at least EMS-basic training. Furthermore, 86.8% are currently working and 13.2% are not.

4.1.2. Respondents' Knowledge:

Results show that when respondents were asked about the definition of 'Trauma', 68.5% defines 'Trauma' as being an injury, 11.2% considers 'Trauma' as being a deep and distressing experience, 1.2% defines 'Trauma' as being an emotional shock, and only 10.3% considers 'Trauma' as being a disease. However, the cumulative of percentages of disease with other options go up to only 14.7%. The low percentage of answers on 'Trauma' which defined as a disease indicates a lack of knowledge of 'Trauma', for according to the U.S. Department of Transportation (2004), 'Trauma' is a disease; it is not an accident. Like heart disease and cancer, 'Trauma' has

identifiable causes with established methods of treatment and defined methods of prevention" (p. 4).

4.1.3. Purpose of 'Trauma Education':

Results show that the majority of 42.6% believes that the purpose of 'Trauma' education is to add an edge to the treatment process of the 'Trauma' patients, and 26.5% stated that 'Trauma' education helps practitioners minimize Traumatic injury. 19.5% indicated that 'Trauma' education is meant for standardization of protocols, and 11.4% stated that this education helps increase people's awareness of 'Trauma'. According to the World Health Organization (2004), 'Trauma' education was formed and guidelines were written in order to reach a standardization of protocols related to 'Trauma' management. These protocols' purpose is to reduce mortality and morbidity resulting from 'Trauma'. However, results show that only 11.4% answered that "Awareness" could be considered as part of the purpose of 'Trauma' education. In fact, standardization of the protocols is meant to educate and give awareness to those who are interested in 'Trauma'. The U.S. Department of Transportation (2004) confirms the aforementioned in its agenda for the incoming years by stating that "'Trauma' care will be coordinated and integrated using standard protocols and triage" (p. 15).

4.1.4. Persons who should be concerned with 'Trauma Education':

Results show a big variety of answers and combinations of answers in regards to who is the target audience who should be trained in 'Trauma' care. Options included medical doctors, nurses, paramedics, public/community, and health educators. All the respondents agree that healthcare providers are the essential people to be trained in 'Trauma' care; in fact, 15.9% chose medical doctors, nurses and paramedics; 37.5% chose "all the options"; and, 46.6% chose a combination of the different available options. However, if one isolates each option is selected, then the distribution becomes as depicted in Table 3. Paramedics are chosen the most, followed by nurses, medical doctors, public and community, and health educators, respectively.

'Trauma' care starts with prevention; as such, it is very important to educate the public and communities to disseminate awareness and teach appropriate methods for management and behavior. Results show that the respondents are aware of the importance of 'Trauma' education at all levels. However, all healthcare providers are to be especially trained equally since 'Trauma' education sets unified standards for the care of the 'Traumatically' injured patient; it does not matter what kind of degrees a healthcare provider has, what matters is that all healthcare providers respond in a unified standardized way.



Table 3: Total percentage distribution of each of the 5 options pertinent to the question "who do you think the 'Trauma' education is meant for?"

Criteria	Total percentage
Medical Doctors	74.2%
Nurses	77.4%
Paramedics	83.2%
Public and community	60.6%
Health educators	55.6%

On the other hand, when respondents were asked if they know about any 'Trauma' training center or if they are aware of any Lebanese hospital that offers training, 55.1% of the respondents claim to have heard about 'Trauma' training centers while 44.9% never heard of it. In addition, among the 55.1% who heard, only 43.5% know of any existing hospital in Lebanon that offers this service.

In Lebanon, there are two centers which offer 'Trauma' Education. Only one of them is internationally accredited and has the exclusivity to provide the American standards of training of 'Trauma'. However, competition among institutions is healthy. The more institutions educate about 'Trauma', the more awareness they instigate in the spirits of the healthcare providers. The aim should remain to standardize the care of the 'Trauma' patients at a more efficient and effective level and reduce mortality and morbidity.

4.1.5. Having attended a 'Trauma' specialized training:

Results show that 63.7% of the respondents have attended specialized 'Trauma' trainings, whereas 36.3% didn't. Further interviews with the attendees show that they meant trainings in other institutions which were not internationally accredited 'Trauma' education providers.

4.1.6. Causes that upset respondents the most when dealing with 'Trauma' patients:

Results show that most of the respondents are upset about five criteria that affect the way they deal with "Trauma" patients; these results are depicted in Table 4.

Table 4: Total percentages distribution of the criteria which lead to disturbance while dealing with a 'Trauma' patient

Criteria	Total percentage, %
Chaos	57.0
Unprofessionalism	51.8
Lack of knowledge of team	44.6
Personal lack of knowledge	30.2
Lack of self-confidence	15.7
Other	09.1

Chaos is not only generated by the rush of people around the 'Trauma' team but is also generated by the team itself when the work is not well organized. However, when the whole team is trained on the same protocol, chaos

becomes an "organized chaos" and stops being a cause of frustration to the 'Trauma' team. Results also show that the respondents attribute their being upset about the unprofessionalism and lack of knowledge of the attending team. The lack of knowledge of the team is a very important gap in the whole 'Trauma' Management procedure; it is really unsafe and insecure to be dealing with a 'Trauma' patient by people who lack knowledge. Again, one should ask if a standardization of education and protocol will minimize this distress.

Results in Table 4 highlight the importance of education in 'Trauma' and stress the fact that healthcare providers have to be professional, self-confident, have confidence in the team they are working with, are knowledgeable, work on proven standards and are able to work appropriately under stress and chaotic conditions. The success of being accomplished in all these factors would increase the chances of survival of the patient and would ensure the success of the team. In fact, the standardization of care limits the chaos and unprofessionalism, increases the knowledge of the whole team, and increases self-confidence.

4.1.7. Training in 'Trauma':

Respondents were very positive when asked about 'Trauma' training. 95.2% of the respondents have an interest in 'Trauma' training, while 4.8% are not interested. Also, 94.4% of the respondents interested in 'Trauma' training would actually register in a 'Trauma' course if offered, while 5.6% will not. Furthermore, of those who are interested in 'Trauma' training, 48.0% will only train if the course is internationally accredited with educational credits, and 52.0% does not care about the international accreditation as long as they are being trained in 'Trauma'.

The enthusiasm that respondents have shown for training reflects the existing gaps assessed when respondents were asked if they can affect positive change if they attend workshops on physical 'Trauma' for patients; 97.3% of the respondents believe that they can make a positive change and 2.7% believes that their performance won't improve. Knowing that training improves the healthcare personnel's proficiency in dealing with 'Trauma' as evidenced by The World Health Organization (2004) which contends that appropriate management of 'Trauma' patient decreases mortality and morbidity and improves the quality of life and chances of survival of the victims of 'Trauma'. Furthermore, respondents were asked if they know about the incurred expenses and cost on physical 'Trauma' injury which usually consist of preventive costs, treatment costs and costs of rehabilitation. Results show that 59.3% of the respondents don't have an idea about how much the cost of physical 'Trauma' injury is, while 40.7% does.

On another hand, 47.4% of the respondents agree that their institution includes experience in working with



physical ‘Trauma’ survivors in defining their job descriptions, while 52.6% does not agree to the fact.

Moreover, when respondents were asked if they had been either admitted or knew of someone admitted to a hospital in Lebanon because of ‘Trauma’, 43.5% responded positively while 56.5% did not. To another question, where respondents were asked if they had experience with ‘Trauma’ admissions in a hospital in Lebanon, out of the 43.5% who responded positively, only 34.5% has a positive feedback from the hospitalization and 8.9% are not satisfied. On the other hand, respondents’ opinion about referral to ‘Trauma’ recovery services or centers is equally distributed at 50%. Most of the respondents verbalized to the researchers that they do not think that there are any ‘Trauma’ specialized centers in Lebanon, but since most were EMTs and healthcare providers, they interpreted this question as being reflective of their decision to transport the patient to the “best facility” for the treatment of this patient.

Responses to another question indicate that 9.9% of the respondents admit that they are not able to explain to a patient what ‘Trauma’ is, including effects, while the grand majority or 90.1% of the respondents are able to explain what ‘Trauma’ is to the patients. Also, results show that 83.3% of the respondents know survivors of a ‘Trauma’ in one’s organization or community whereas 16.7% know people who did not survive ‘Trauma’. These results are encouraging since training personnel who are aware of ‘Trauma’ situation have better performance and further dedication (Barach & Weinger, 2015, p. 106).

4.1.8. Attitude toward ‘Trauma’ and ‘Trauma’ Education:

For the sake of simplicity and brevity, the 5-level Likert scale responses were condensed to only three; whereby, “Strongly Agree and Agree” were added into “Agree” and “Strongly Disagree and Disagree into “Disagree”. This way, responses categorize statements clearly. Table 5 shows that the majority of 74.2% agrees that they are knowledgeable about ‘Trauma’ care, while 18.8% are uncertain and 5.2% disagree. These results are interesting to look at. These percentages are somehow contradictory with the level of certainty respondents showed previously in being able to explain to the victims/patients about ‘Trauma’ patients.

Table 5 shows that 88.5% of the respondents agree that health insurances should cover the cost of ‘Trauma’ (see Figure 1). Further, 83.6% only trust the specialized centers that have good healthcare providers capable of administering professional ‘Trauma’ care to them or their families. Also, 95% agrees that ‘Trauma’ services in Lebanon need to be dramatically improved. Moreover, around 92% agrees about the impact of ‘Trauma’ education (training programs to medical personnel) on the outcome on lives.

Table 5: Attitude toward ‘Trauma’ and ‘Trauma’ Education

No.	Statement	A	U	D	Missing
1	Presenting oneself as a knowledgeable person in ‘Trauma’ care	74.2	18.8	5.2	1.8
2	Health insurances should always cover ‘Trauma’ injuries	88.5	8.5	1.2	1.8
3	Only trusting specialized medical centers to have good health care providers capable of administering professional ‘Trauma’ care to me and my family	83.6	8.8	7.1	0.5
4	‘Trauma’ Training Programs would save ‘Trauma’ injured patients	92.1	4.1	2.1	1.7
5	Trained medical personnel would reduce deaths caused by ‘Trauma’	92.4	4.1	1.8	1.7
6	Good ‘Trauma’ care involves getting the patient to the right place at the right time for the right care	95.2	1.5	1.2	2.1
7	‘Trauma’ services in Lebanon need to be dramatically improved	95.0	2.1	0.6	2.3
8	‘Trauma’ injury is the first leading cause of death in Lebanon	63.9	28.7	4.8	2.6

Note: Sample = 341 Respondents; Numbers are in Percentage (%).

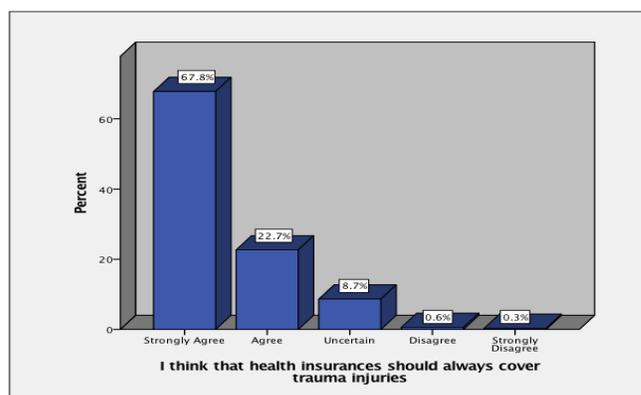


Figure 1. Health insurances should always cover ‘Trauma’ injuries

Table 5 shows that 63.9% agrees that ‘Trauma’ injury is considered to be the first leading cause of death in Lebanon. The large percentage of uncertainty (28.7%) on this question may imply that there is a lack of knowledge



of ‘Trauma’ in Lebanon. In fact, researchers had trouble collecting data given that sources are not reliable and are limited to one, namely, the Lebanese Red Cross’s registry of emergency calls. In addition, Table 5 and Figure 2 show that the majority of 95.2% agrees that good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care. In fact, that is what is commonly referred to as the Golden Period.

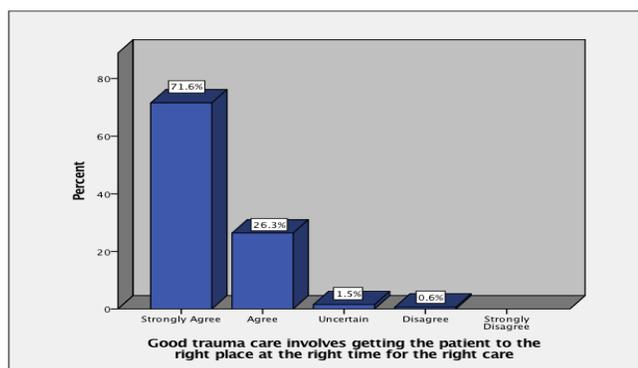


Figure 2. Good ‘Trauma’ care involves getting the patient to the right place at the right time for the right care

4.1.9. Usefulness of ‘Trauma’ Education:

Table 6: Usefulness of ‘Trauma’ Education

No.	Statement	A	U	D	Missing
1	Ministry of Health (MOH) in Lebanon has the adequate resources to implement the ‘Trauma’ training in Lebanon and the region	30.2	34.6	33.1	2.1
2	‘Trauma’ injured patients need to be transferred to a major center abroad	40.8	22.3	26.1	2.1
3	If given the choice for curriculum decision, ‘Trauma’ Education is definitely included	92.4	4.1	0.6	2.9
4	If given the choice to where to go in case of ‘Trauma’ emergency, the choice is a center which has professionally trained ‘Trauma’ team	94.2	1.2	2.3	2.3
5	If given the choice to recommend, the recommendation is that ‘Trauma’ Education be mandatory to all health care providers dealing with ‘Trauma’ patients	94.5	1.5	1.7	2.3
6	‘Trauma’ Education is informative	93.0	2.3	3.2	1.5

Table 6 shows that 30.2% agrees that the MOH in Lebanon has the adequate resources to implement ‘Trauma’ training in Lebanon, while 35.3% is not certain, and 33.9% disagrees. In fact, after implementing the internationally accredited courses in Lebanon, and the resulting increased awareness after 3 years of implementation, the MOH has joined efforts to start mandating ‘Trauma’ training of all Health care providers working in the Emergency Departments at all Lebanese hospitals in order to accredit the concerned hospitals. This step is a stepping stone to a very long journey for ‘Trauma’ Management in the country.

Table 6 shows that 40.8% of the respondents agree that ‘Trauma’ injured patients have to be transferred to major centers outside Lebanon for better care, while 22.3% is uncertain and 26.1% disagrees. Though most of the respondents agree that ‘Trauma’ management need to be dramatically improved in Lebanon, they do not agree that patients need to be transferred outside the country for treatment. Correlation between these two statements will be looked at to see the strength of the relation. Moreover, the majority of 92.4% agrees to include ‘Trauma’ Education in the curriculum, while 4.1% is uncertain and 0.6% disagrees. 94.2% agrees to go to centers which have professionally trained ‘Trauma’ team while 1.2% is uncertain and 2.3% disagrees. Also, 94.5% agrees to have ‘Trauma’ Education mandatory for all healthcare providers who deal with ‘Trauma’ patients, while 1.5% is uncertain and 1.7% disagrees. Finally, 93.0% agrees that ‘Trauma’ Education can be informative, while 2.3% is not certain and 3.2% disagrees of the added value of ‘Trauma’ Education.

4.1.10. Assessment of concerns of implementation of ‘Trauma’ Education:

Table 7: Assessment of concerns of implementation of ‘Trauma’ Education

No.	Statement	A	U	D	Missing
1	Getting valuable information from ‘Trauma’ Education	94.1	3.5	0.3	2.1
2	‘Trauma’ Education should be conducted as part of the academic assignments and awareness of it should be taught in schools and universities	84.4	12.9	1.8	0.9
3	‘Trauma’ Education widens knowledge and prepares for better management of ‘Trauma’ patients	95.6	1.9	1.8	0.9



Table 7 shows that 94.1% of the respondents agree that they get valuable information from ‘Trauma’ education while 3.5% is not certain and only 0.3 % disagrees. 85.2% agrees that ‘Trauma’ Education should be added to the curriculum of schools and universities, while 12.9% is not certain and 1.8 % disagrees. Also, 95.6% agrees that ‘Trauma’ education widens their knowledge and prepares them for better management of ‘Trauma’ patients, while 1.9% of respondents are not certain and 1.8% disagrees.

4.2. Inferential Statistics:

4.2.1. Correlations:

Hejase and Hejase (2013) contend that to study the relationship between two variables a contingency table is used, “a table to classify cases according to two identifiable nominal or ordinal measurement characteristics. This table is a cross-tabulation that simultaneously summarizes two variables of interest” (p. 292). Next, several relationships are tested with the purpose of exploring later on the necessary causal equations which will help researchers assess the research concepts under study.

valuable information from ‘Trauma’ education (94%); I only trust specialized medical centers to have good health care providers capable of administering professional ‘Trauma’ care to me and my family (83%); ‘Trauma’ services in Lebanon need to be dramatically improved (95%); ‘Trauma’ Training Programs would save ‘Trauma’ injured patients (92%)”.

Table 8 shows the results of performing correlation and cross-tab analysis. All crosstabs are studied by analyzing Pearson R correlation parameters and Chi Square analysis. For the sake of simplicity, one full analysis is demonstrated and all others follow suit. Table 8 shows that for the first 2 variables, the value of calculated Pearson χ^2 is 172.409, the degree of freedom is 12, and p-value under Asymp. Sig is 0.000. The tabulated value of χ^2 corresponding to $df = 12$ at 5% level of confidence is 21.03. Then, since calculated χ^2 value = 172.409 is greater than tabulated χ^2 value = 21.03, this indicates that the first variable fits the analysis of the other. The p-value is 0.000 less than 5% which indicates that the relation between the two variables is statistically significant. Furthermore, there is a marginal and positive statistically significant linear

Table 8: Cross-tabulations “Good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care” * Selected statements

No.	Main Variable	Tested Variables	Pearson's R	Approx. Sig.	Chi-Sq. χ^2	df	Tab. χ^2	Asymp. Sig.
1		Trained medical personnel would reduce deaths caused by Trauma	.469	.000	172.409	12	21.03	.000
2		I get valuable information from ‘Trauma’ education	.232	.000	35.452	9	16.92	.000
3	Good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care	I only trust specialized medical centers to have good healthcare providers capable of administering professional ‘Trauma’ care to me and my family	.251	.000	34.567	12	21.03	.001
4		‘Trauma’ services in Lebanon need to be dramatically improved	.326	.000	117.830	12	21.03	.000
5		‘Trauma’ Training Programs would save ‘Trauma’ injured patients	.387	.000	100.939	12	21.03	.000

Results of studying the cross-tabulation of the main variable “Good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care” shows that 93% of the respondents who agree with this statement also agree that trained medical personnel would reduce deaths caused by ‘Trauma’. Similar crosstab analysis between the main variable with four other variables show that respondents demonstrate very high agreement between each of the two pairs of compared variables, namely, “I get

relationship between the variables (Pearson’s R = 0.469 which is less than 70% and greater than 30%; and Approx. Sig. = 0.000 < standard error $\alpha = 5\%$).

Similarly, the pair of variables “Main versus 2, or 3, or 4, or 5” are all relations which are statistically significant, though showing weak and positive relationships based on their Pearson’s “R” values.



Further analysis of cross-tabulations leads to the following results:

(1) Respondents who believe that they could affect positive change if they attend workshops on physical 'Trauma' for victims/patients also agree that they would register in 'Trauma' courses if offered. This relation is marginal (marginal R) and positive and statistically significant.

(2) Respondents who believe that they could affect positive change if they attend workshops on physical 'Trauma' for victims/patients also agree that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients. This relation is marginal (marginal R) and negative (reverse coding) and statistically significant.

(3) Respondents who refer patients to 'Trauma' recovery services or centers also agree that they get a positive feedback from these patients. This relation is very weak (very small R) and positive and statistically significant.

(4) Respondents who refer patients to 'Trauma' recovery services or centers also agree that 'Trauma' services in Lebanon need to be dramatically improved. However, this relation is very weak (very small R) positive but is not statistically significant (calculated Pearson $\chi^2 <$ tabulated Pearson χ^2) & (R-Approx. Sig. $>$ standard error $\alpha = 5\%$).

(5) Respondents who refer patients to 'Trauma' recovery services or centers also agree that there are 'Trauma' survivors in their organization or community. This relation is very weak (very small R) and positive and statistically significant.

(6) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients also agree that they get valuable information from 'Trauma' education. This relation is marginal (marginal R) and positive and statistically significant.

(7) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that health insurances should always cover 'Trauma' injuries. This relation is weak (weak R) and positive and statistically significant.

(8) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that they present themselves as knowledgeable about 'Trauma' care. This relation is weak (weak R) and positive and statistically significant.

(9) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that 'Trauma' Training Programs would save 'Trauma' injured patients. This relation is weak (weak R) and positive, and statistically significant.

(10) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that their

organizations include experience in working with physical 'Trauma' survivors in job descriptions. However, this relation is very weak (very small R) positive but is not statistically significant (calculated Pearson $\chi^2 <$ tabulated Pearson χ^2) & (R-Approx. Sig. $>$ standard error $\alpha = 5\%$).

(11) Respondents who believe that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that 'Trauma' education can be informative. This relation is weak (weak R) and positive, and statistically significant.

4.2.2. Regression Analysis:

According to Hejase & Hejase (2013) a "multiple-regression model is needed when the researcher faces the scenario where more than one independent variable is causing variations in the dependent variable under study" (p. 478). Therefore, the next step is to construct possible causal relationships which may help analyze the impact of 'Trauma' education and awareness on either health care providers or organizational factors. For such purpose and following the style reported in Hejase, Hamdar, Nouredin, Hejase and Nsouli (2017) to account for the qualitative meaning of the multivariable relationships, "standardized betas models are used, of the form $Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots$ ". All accepted models are qualitatively justified, whereby Pearson R's, R-Square, F-factor (ANOVA), and coefficients (Betas) are statistically significant.

4.2.2.1. Regression models:

Table 9 is constructed from three SPSS generated tables, namely, the Model Summary, the ANOVA, and the Coefficients Tables. Table 9 shows that causal analysis has led to the generation of 4 multivariable relationships. The resultant models are generated using Stepwise analysis, whereby independent variables are assessed through several calculation cycles in which all independent variables are assessed based on 95% statistical certainty. All variables, whose calculated probabilities are greater than the standardized error of 5%, are excluded.

For the sake of brevity, details needed to justify the statistical significance of all the models follow the same approach used herein to analyze Model "1" (Tables 9 & 10). Results indicate that Model '1' is qualitatively suitable due to the marginal values of the coefficient of correlation ($R = 0.547$) and the coefficient of determination ($R^2 = 0.300$), respectively; however, the model is also qualitatively acceptable and statistically significant with an associated probability of 0.048 (which is less than $\alpha = 0.05$). ANOVA testing indicates that the regression equation predicts better than would be expected by chance. The F-value = 20.871 with an associated probability of Sig P. = .000 $<$ $\alpha = 5\%$. Furthermore, Model 1 has all standardized Betas which are statistically significant with probabilities (.000, .001, .004, .011, and .048 all less than the standard error of 5%). Furthermore, the interpretation



of standardized Betas is applied to all explanatory variables as follows: The independent variable “ X_1 ” has a regression standardized weight of “ β_1 ”. This means that as this variable “ X_1 ”, increases by one standard deviation (SD), the dependent variable “DV” will increase by “ β_1 ” of a SD.
 4.2.2.2. Regression Model One:

Table 10 shows that the five independent variables or “IV” (explanatory variables) have direct relationship with the dependent variable “DV” “Good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care”, then:

IV(1): Trained medical personnel would reduce deaths caused by ‘Trauma’

This direct relation implies that respondents who feel that the attending medical personnel is trained and consequently would reduce deaths caused by ‘Trauma’, also believe that good ‘Trauma’ care involves getting the patient to the right place, at the right time, for the right care.

IV(2): I get valuable information from ‘Trauma’ education

This direct relation implies that the more respondents are satisfied with their ‘Trauma’ education the

Table 9: *Regression Models Analysis*

Model	Pearson R	R ²	Sig. P	F	Sig. P	Standardized Betas	Sig. P
1 (5 Cycles)	.547 ^e	.300	.048	20.871	.000	$\beta_1 = .267$	.000
						$\beta_2 = .184$	.001
						$\beta_3 = .161$	.004
						$\beta_4 = .144$	.011
						$\beta_5 = .119$	.048
2 (2 Cycles)	.563 ^b	.317	.000	57.359	.000 ^c	$\beta_1 = .419$	.000
						$\beta_2 = -.267$	.000
3 (3 Cycles)	.318 ^c	.101	.034	9.312	.000 ^d	$\beta_1 = .251$	.000
						$\beta_2 = .145$	.017
						$\beta_3 = .128$	.034
4 (6 Cycles)	.664 ^f	.440	.016	31.992	.000 ^e	$\beta_1 = .382$	.000
						$\beta_2 = .213$	.000
						$\beta_3 = .166$	.001
						$\beta_4 = .147$	.004
						$\beta_5 = .114$	.016
						$\beta_6 = .126$	.016

Table 10: *Regression Models*

Independent Variable	Standardized Betas	Dependent Variable
Model I		
Trained medical personnel would reduce deaths caused by ‘Trauma’	.267	Good ‘Trauma’ care involves getting the patient to the right place at the right time for the right care
I get valuable information from ‘Trauma’ education	.184	
I only trust specialized medical centers to have good healthcare providers capable of administering professional ‘Trauma’ care to me and my family	.161	
‘Trauma’ services in Lebanon need to be dramatically improved	.144	
‘Trauma’ Training Programs would save ‘Trauma’ injured patients	.119	
Model II		
Would you register in ‘Trauma’ courses if offered?	.419	Do you believe that you could affect positive change if you attend workshops on physical ‘Trauma’ for victims/patients?
I think ‘Trauma’ education widens my knowledge and prepares me for better management of ‘Trauma’ patients	-.267	
Model III		
Did you get a positive feedback?	.251	Do you refer patients to ‘Trauma’ recovery services or centers?
‘Trauma’ services in Lebanon need to be dramatically improved	.145	
Are there ‘Trauma’ survivors in your organization or community?	.128	
Model IV		
I get valuable information from ‘Trauma’ education	.382	I think ‘Trauma’ education widens my knowledge and prepares me for better management of ‘Trauma’ patients
I think that health insurances should always cover ‘Trauma’ injuries	.213	
I present myself as a knowledgeable person about ‘Trauma’ care	.166	
‘Trauma’ Training Programs would save ‘Trauma’ injured patients	.147	
Does your organization include experience in working with physical ‘Trauma’ survivors in job descriptions?	.114	
I think ‘Trauma’ education can be informative	.126	



stronger they feel that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care.

IV(3): I only trust specialized medical centers to have good health care providers capable of administering professional 'Trauma' care to me and my family:

This direct relation implies that the more respondents trust specialized medical centers to have good health care providers capable of administering professional 'Trauma' care to them and their family, the more they will encourage the notion that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care.

IV(4): 'Trauma' services in Lebanon need to be dramatically improved:

This direct relation implies that the more respondents are convinced that 'Trauma' services in Lebanon need to be dramatically improved, the more they will encourage the notion that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care.

IV(5): 'Trauma' Training Programs would save 'Trauma' injured patients:

This direct relation implies that the more respondents feel that 'Trauma' Training Programs would save 'Trauma' injured patients, the more they will encourage the notion that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care.

Model One's results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always convince health care professionals that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care; in addition, health care professionals will be sure that fatalities would be less and that appropriate treatment is provided. Consequently, the main point of this research is to show that sustained efforts to keep active positive awareness of 'Trauma' education and practices will lead to the positive work environment and positive leadership; both will promote organizational readiness to implement 'Trauma' Training Programs.

4.2.2.3. Regression Model Two:

Table 10 shows that the two independent variables or "IV" (explanatory variables) have direct relationship with the dependent variable "DV" "Do you believe that you could affect positive change if you attend workshops on physical 'Trauma' for victims/patients?", then:

IV(1): Would you register in 'Trauma' courses if offered?

This direct relation implies that respondents who register for 'Trauma' courses would boost their ability to produce positive change for victims/patients.

IV(2): I think 'Trauma' education widens my knowledge and prepares me for better management of 'Trauma' patients:

This indirect relation may be explained by the fact of reverse coding (for the DV, the option is to answer positively first, while for the IV, the option is to answer negatively first). Therefore, the relation implies that the more respondents are satisfied with the notion that 'Trauma' education widens knowledge and prepares for better management of 'Trauma' patients, the more they will feel satisfied that they could affect positive change if they attend workshops on physical 'Trauma' for victims/patients.

Model Two's results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always encourage health care professionals that good 'Trauma' care involves better management and better services to 'Trauma' victims/patients. Consequently, this research shows that sustained efforts to keep active positive awareness of 'Trauma' education and practices with actual training and education will lead to the positive work environment and positive leadership; both will promote organizational readiness to implement 'Trauma' practices to patients.

4.2.2.4. Regression Model Three:

Table 10 shows that the three independent variables or "IV" (explanatory variables) have direct relationship with the dependent variable "DV" "Do you refer patients to 'Trauma' recovery services or centers?", then:

IV(1): Did you get a positive feedback?

This direct relation implies that the more respondents feel at ease when they refer their patients to 'Trauma' recovery services or centers, the more they will get positive feedback. 'Trauma' recovery services or centers are known to offer professional and quality services besides their good branding or reputation.

IV(2): 'Trauma' services in Lebanon need to be dramatically improved

This direct relation implies that the more respondents feel at ease with the quality of 'Trauma' services in Lebanon, the more they feel they will get positive feedback.

IV(3): Are there 'Trauma' survivors in your organization or community?

This direct relation implies that the more respondents know that there are 'Trauma' survivors in their



organization or community, the more they feel they will get positive feedback.

Model Three's results emphasize the fact that respondents will only refer patients to 'Trauma' recovery services or centers if they feel that positive feedback exists, if 'Trauma' services in Lebanon are better, and if there are survival accounts from patients who survived 'Trauma' cases. Consequently, it is the view of this research that sustained efforts to keep active positive attitude toward 'Trauma' practices will eventually enforce the referrals to 'Trauma' recovery services and centers.

4.2.2.5. Regression Model Four:

Table 10 shows that the six independent variables or "IV" (explanatory variables) have a direct relationship with the dependent variable "DV" "I think 'Trauma' education widens my knowledge and prepares me for better management of 'Trauma' patients", then:

IV(1): I get valuable information from 'Trauma' education

This direct relation implies that the more respondents feel that they get valuable information about 'Trauma' Education the more they will think 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients.

IV(2): I think that health insurances should always cover 'Trauma' injuries

This direct relation implies that the more respondents feel that health insurances should always cover 'Trauma' injuries, the more they feel that the 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients. Having alternatives that are related to health insurance simplifies management issues related to 'Trauma' injuries.

IV(3): I present myself as a knowledgeable person in 'Trauma' care

This direct relation implies that the more respondents feel that they are knowledgeable about 'Trauma' Education, the more they will think 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients.

IV(4): 'Trauma' Training Programs would save 'Trauma' injured patients

This direct relation implies that the more respondents feel that 'Trauma' Training programs would be vital to saving 'Trauma' injured patients, the more they will think 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients.

IV(5): Does your organization include experience in working with physical 'Trauma' survivors in job descriptions?

This direct relation implies that the more respondents feel that their organizations have job descriptions which include experience in working with physical 'Trauma' survivors, the more they will think 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients.

IV(6): I think 'Trauma' education can be informative

This direct relation implies that the more respondents feel that their information is made richer by 'Trauma' education the more they will think 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients.

Model four's results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always enrich the stance towards 'Trauma' education per se and will increase the management proficiency of the trainees toward their 'Trauma' patients. Consequently, it is the view of this research that sustained efforts to keep active positive attitude toward 'Trauma' education and accompanied practices will eventually improve management of 'Trauma' patients.

4.3. Reliability:

The Internal Reliability of the 17-item scale is assessed using the Cronbach's Alpha technique. Table 11 shows that the 17-item scale produced a Cronbach's Alpha = 0.616 which belongs to the range $0.6 < \alpha < 0.7$ "Moderate" and acceptable in exploratory research" (Burns and Burns, 2008, p. 481). This indicates a good strength of association and proves that the selection of the questions is suitable for the questionnaire purpose.

Table 11: Reliability Statistics

Cronbach's Alpha	N' of Items
.616	17

5. Conclusions and Implications:

The purpose of this research is to assess the level of awareness of 'Trauma' and issues pertaining to its implementation among members of a selected group of Lebanese healthcare workers. This study also assesses the behavior and the attitude of the selected sample of Lebanese respondents to discern the extent to which they are ready to confirm to the theories and principles of 'Trauma'; and, its impact on the performance of healthcare workers in Lebanon.

This research empirically supports the assessed concepts as to:

1. Lebanese healthcare providers are aware of effects of 'Trauma' Education.



2. Lebanese healthcare providers are aware of the importance of 'Trauma' Management
3. Lebanese healthcare providers are aware of the effect of 'Trauma' Management on improving the outcome of victims of 'Trauma'
4. Lebanese healthcare providers are aware of 'Trauma' Education and 'Trauma' Management
5. Lebanese healthcare providers have a positive attitude toward 'Trauma' Education

1. Lebanese healthcare providers are aware of the effects of 'Trauma' Education:

Model four results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always enrich the stance towards 'Trauma' Education per se and will increase the management proficiency of the trainees toward their 'Trauma' patients. Results show that 42.6% of the respondents believe that the purpose of 'Trauma' education is to treat 'Trauma' patients, and 26.5% specified that 'Trauma' education helps minimize traumatic injury, 19.5% indicated that 'Trauma' education is meant to standardize the protocols, and 11.4% opted for awareness. Evidence shows that appropriate management of 'Trauma' patient decreases mortality and morbidity and improves the quality of life and chances of survival of the victims of 'Trauma' (U.S. Department of Transportation, 2004; World Health Organization, 2004; NCTTRAC, 2010). 97.3% of the respondents believe that they can make a positive change if they were to attend workshops on 'Trauma', and 2.7% believe that their performance will not improve if they attend 'Trauma' educational workshops.

2. Lebanese healthcare providers are aware of 'Trauma' Education and Management and their importance:

Results show that respondents believe that the following three categories of health care personnel are much concerned with 'Trauma' education, paramedics first 83.2%, nurses second 77.4%, and medical doctors third 74.2%.

Cross tabulation Model 1 shows a marginal and positive relationship ($R = 0.469$) which is statistically significant between the two variables: "Trained medical personnel would reduce deaths caused by 'Trauma' and "identifying that good 'Trauma' care involves getting the patient to the place at the right time for the right care there is".

Other results show that 320 out of 335 (96%) of the respondents who believe that they could affect positive change if they attend workshops on physical 'Trauma' for victims/patients, also agree that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients. And that 314 out of 333 (94%) of the respondents who agree that 'Trauma' education widens their knowledge and prepares them for better management of 'Trauma' patients, also agree that they get valuable information from 'Trauma' education.

3. Lebanese healthcare providers are aware of the effect of 'Trauma' Management on improving the outcome of victims of 'Trauma':

Results show a variable distribution of the answers of the respondents concerning 'Trauma' education indication. The majority of 57.5% agrees that 'Trauma' education has a purpose in treating 'Trauma' patients and minimizing traumatic injury; 19.5% indicates that 'Trauma' education is meant for standardization of protocols; and, 8.8% states that such education is indicative of awareness. The aforementioned results are not really encouraging because the highest percentage remains marginal, indicating that respondents are not fully aware of the effect of 'Trauma' management's consequences, though they are ready to learn more through training. On the other hand, the Regression Model One explains the positive understanding of the respondents. In fact, the Regression Model One results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always encourage health care professionals that good 'Trauma' care involves getting the patient to the right place, at the right time, for the right care, hence assuring health care professionals that fatalities are less and the appropriate treatment is provided. The World Health Organization (WHO) (2004) supports the fact that a better management of 'Trauma' patients leads to an increase in the survival rates and a decrease in morbidity and mortality. This research sustains that efforts to keep active positive awareness of 'Trauma' education and practices will lead to the positive work environment, and that positive leadership will promote organizational readiness.

4. Lebanese healthcare providers are aware of 'Trauma' Education and 'Trauma' Management:

Results show that 68.5% of the respondents define 'Trauma' as being an injury, 11.2% considers 'Trauma' as being a deeply and distressing experience, 1.2% defines 'Trauma' as being an emotional shock, and only 10.3% considers 'Trauma' as being a disease. The cumulative of percentages of disease with other options goes up to only 13.2%. The aforementioned definitions are actually addressed by many world authorities (U.S. Department of Transportation, 2004; The National Child Traumatic Stress Network, 2008; Martin and Meredith, 2008; and Krug, 2004). Furthermore, this research shows (refer to Table 3) that respondents agree that most of health care stakeholders are concerned about being aware of and trained in 'Trauma', including paramedics who are categorized as most concerned, followed by nurses, medical doctors, public and community, and health educators, respectively. Moreover, Regression Model Four results emphasize the fact that positive awareness of 'Trauma' education and its consequences will always enrich the stance towards 'Trauma' education per se and will increase the management proficiency of the trainees toward their

'Trauma' patients. Consequently, this research sustains the efforts to keep active positive attitude toward 'Trauma' education; accompanied practices will eventually improve management of 'Trauma' patients.

5. Lebanese healthcare providers have a positive attitude to 'Trauma' Education:

The majority of 75.5% of the respondents agrees or strongly agrees that they are knowledgeable about 'Trauma' care. Also, 90.5% agrees or strongly agrees that health insurances should cover the cost of 'Trauma', and 84.0% only trusts the specialized centers to have good health care providers capable of administering professional 'Trauma' care to them or their families. In addition, the majority of 94.0% agrees or strongly agrees about the direct impact of 'Trauma' education on the outcome on patients' lives, and 94.7% agrees or strongly agrees about the impact of the medical personnel on the outcome of 'Trauma' care. Finally, 97.6% agrees or strongly agrees that 'Trauma' services in Lebanon need to be dramatically improved. The aforementioned findings describe the overall attitude of the respondents towards 'Trauma' Education and support their positive stance towards the implementation of a well-managed 'Trauma' system in Lebanon.

Furthermore, when respondents were asked about what upsets them the most when dealing with 'Trauma' injured patients, their responses as per Table 4 highlight the importance of education in 'Trauma' and stress the fact that healthcare providers have to be professional, self-confident, confident in the team they are working with, are knowledgeable, work on proven standards, and are able to work appropriately under stress and in chaotic environment. All these factors combined increase the chances of survival of the patient and the success of the team. Moreover, all of the aforesaid factors are important since an adequate education in 'Trauma' management covers all these factors. In fact, the standardization of care limits the chaos and unprofessionalism increases the knowledge of the whole team and increases the self-confidence.

This research has shed light on 'Trauma' Education that is considered of high priority for the health care services. 'Trauma' Education nowadays is a potential value-added factor that increases patients' confidence and has demonstrated the high quality of health services. 'Trauma' Education has been found to be a potential catalyst that supports the appropriate management of the health care providers. The objective is to establish a safe and reliable method for immediate management of the injured patient and to provide the basic knowledge necessary to

- Assess the patients' condition rapidly and accurately.
- Resuscitate and stabilize the patient according to priority.
- Determine if the patients' needs exceed a facility's capacity.

- Arrange appropriately for the patients' inter-hospital transfer (who, what, when and how).
- Assume that optimum care is provided and that the level of care does not deteriorate at any point during the evaluation, resuscitation or transfer process.

The subjective data collected from the survey concerning

- *Patient's family members
- *Patient being semi- or unconscious
- *Lack of proper communication
- *Absence of national protocol to define the convenient hospitals
- *Doctors are not trained enough
- *Doctors in the ER are not trained enough and cannot assess the seriousness of the case
- *Lack of analysis of the mechanism of injury
- *Lack of coordination with other services (police, civil defense...)
- *Society's reaction when dealing with such cases; they usually don't leave room for the EMTs
- *Lack of adequate equipment/equipment failure
- *Lack of bystanders' knowledge
- *Lack of coordination among team members
- *No standardized protocol
- *Lack of specialized transfer teams from site of 'Trauma' to emergency departments

the question of "what upsets you the most while dealing with 'Trauma' patients are stated in Exhibit 5.

Exhibit 5. What upsets stakeholders the most when dealing with a 'Trauma' patient?

WHO (2004) as well as The National Academies Press (2007) emphasize the need for "a coordinated approach to 'Trauma' care and injury prevention, whereby, optimal care is delivered to injured patients when preconceived processes and resources are coordinated in an organizational plan. A well-organized 'Trauma' system allows patients to move seamlessly and expediently through the system" (Para 14).

This research emphasizes the fact that there are many strategic and positive implications that affect both national and institutional policy making as a result of a successful implementation of the plan of inaugurating at least one 'Trauma' Training Center in Lebanon; they include:

1. A reduction in deaths caused by 'Trauma'.
2. A reduction in the number and severity of disabilities caused by 'Trauma'.
3. A decrease in the number of death and disability.
4. A decrease in the costs associated with initial treatment and continued rehabilitation of 'Trauma' victims.
5. A reduced burden on local communities.
6. A decrease in the impact of the disease on "secondary 'Trauma'" victims: the families.



This research has many attributes, including being the first academic and parametric research performed in Lebanon relevant to 'Trauma' Education and Trauma Care. Consequently, this paper adds to the body of knowledge of 'Trauma' Education in the Middle East, inciting other researchers to carry out comparative studies needed to construct a general assessment of 'Trauma' Education in the region. 'Trauma' is a new and important concept treated worldwide; as such, it is necessary to have a better awareness of it in countries such as Lebanon, where the healthcare system is lagging behind, and the injury rate is high.

6. Limitations and Future Research:

The current research has limitations manifested in the sample size and the conventional approach to sampling as well as the representation of the Lebanese health care personnel. Consequently, findings may not be generalized though considered primary data and fundamental to the exploratory research on hand. Regardless of such limitations, this research does offer an indispensable insight into and contribution to the assessment and understanding of the Lebanese healthcare personnel involved in dealing with 'Trauma' cases. On the other hand, many future types of research can be done in this field; some of them are mentioned herein:

- Expansion of the same research to involve all hospitals and healthcare institutions in Lebanon.
- Development of a 'Trauma' registry based on archives and new cases admitted into the emergency departments.
- Feasibility study of inclusion of 'Trauma' Education in schools and universities.
- Performance improvement plans on the outcome of the 'Trauma' care after training a certain number of health care providers in the above mentioned 'Trauma' programs.

A significant research can be conducted as well based on the current research to evaluate the post assessment of the population who took the internationally accredited courses inaugurated in Lebanon, in the TTC, since 2010. Furthermore, assess the impact of these courses on the 'Trauma' -injured patients and the quality of care in Lebanon, and the performance of these healthcare providers in the management of the 'Trauma' patients, using a standardized approach to 'Trauma' care.

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