

First Aid and Transportation Course Contents Based on Experience gained in the Iran-Iraq War: a Qualitative Study

Forogh Sarhangi¹; Hamid Reza Gholami^{2,*}; Morteza Khaghanizade³; Soheil Najafi Mehri⁴

¹Faculty of Nursing, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

²Trauma Research Center, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

³Behavioral Sciences Research Center, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

⁴Faculty of Nursing, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Hamid Reza Gholami, Trauma Research Center, Baqiyatallah University of Medical Sciences, Tehran, IR Iran. Tel: +98-212126127278, Fax: +98-2122289941, E-mail: gholamihamidreza@ymail.com

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Background: Effective first aid and transportation influences injury-induced mortality. But few qualitative studies have been conducted so far in this area.

Objectives: The aim of this study was to identify the content of the first aid and patient transportation course based on experience gained from the Iran-Iraq war.

Patients and Methods: This was a conventional qualitative content analysis study; a purposeful sample of 14 first aid and transportation experts who had worked during the Iran-Iraq war was recruited. We collected and analyzed the study data by using the semi-structured interview method and the conventional content analysis approach respectively. Each interview transcript was reviewed several times. Words, sentences, and paragraphs were labeled with codes. Codes were compared with each other and categorized according to their similarities. Similar sub-categories and categories were also grouped together and formed themes.

Results: Study participants' experiences of wartime first aid and transportation (FAT) education fell into two main themes including 'the congruence of education and educational needs' and 'managers' engagement in FAT education. The four main categories of these two themes were use of appropriate educational facilities, adopting effective teaching strategies, universal FAT education and specialized training skills.

Conclusions: The two key requirements of the first aid and transportation courses are practicality and managerial engagement. We developed and provided specific guidance of FAT curriculum by using the study findings. This curriculum is recommended for educating FAT staffs, paramedics, emergency technicians, and military nurses.

Keywords: First Aid; Transportation; War; Prehospital Trauma Care

1. Background

First aid and transportation is considered as the first step of prehospital services. This service takes place initially by first care responders, the ones who are first on the scene (1). The aim of first aid and transportation services includes immediate assessment and response and timely transport in order to save lives, prevent disability and decrease mortality. The services that are rendered in the field can significantly alter the outcome (2). Where approximately 50% of injury deaths occur in the pre-hospital setting (3) in view of the fact that trauma is the fourth leading cause of death in Iran, and nearly 15.2% of all deaths seem to be due to trauma (4, 5). Thus first aid and transportation are important and first care responders and non-medical bystanders with medical skills are essential for safe management in the front line of the pre-hospital trauma care (6, 7). Accordingly the first aid training program for first care responders will help provide initial care and improve outcomes (8). In addition many studies have shown that "organized trauma systems" for

injured persons, reduce mortality rates (9, 10). At present the relevant advances that have occurred in prehospital trauma care driven by combat experience (11). The lessons learned from combat experience, wide-ranging first aid and transportation, wound management, emergency surgery, infection control and blood banking, also require knowledge, training, equipment, and implementation (12). Although in modern warfare, the tools and skills available today, require strategy, appropriate education and equipment that can increase the survivability of the fighting force (13). However, educational planning should be done based on educational need such as controlling hemorrhage – the first cause of death, in potentially survivable combat injuries, particularly in the prehospital setting (14, 15). As a result, military medicine has a strategy for care, inclusive training for an individual soldier; thus every soldier before each deployment, learns to treat hemorrhage, using tourniquets and applying hemostatic dressings as well as basic casualty management from the

time of injury all the way until evacuation (16). Therefore, determining priorities according to clear patterns and standards can increase the effectiveness of educational activities and the needs of societies (17).

Iranian veterans of the 8-year Iran-Iraq war have valuable experience in the field of military medicine and FAT. This knowledge can be used for improvement of the FAT curriculum. A study by Babatabar et al. (2009) showed that the Iran-Iraq wartime FAT curriculum despite its weaknesses was highly effective and widely applicable (18). Also Amerion et al. (2009) highlighted that the Iran-Iraq wartime FAT curriculum had been developed and run in three ranges of cognitive, effective, and psychomotor implications and reported that some areas of the program including management of abdominal injuries need to be revised (19).

2. Objectives

FAT experience can be used for improvement of the FAT curriculum. Therefore we aimed to assess the content of the FAT course based on experience gained from the Iran-Iraq war.

3. Patients and Methods

This was a conventional qualitative content analysis study. The conventional qualitative content analysis approach was selected because many studies have shown that using the first-hand experience of people who have been directly involved with a phenomenon can positively affect the outcomes of education regarding that phenomenon (20, 21). The study setting was the Iranian Military Force Health Center, Tehran, Iran in 2013. The study population were men that consisted of professional FAT staffs who served in the Iran-Iraq war and have experience of teaching FAT course including paramedics, medical assistants and nurses. The inclusion criteria were having the experience in teaching FAT courses during Iran-Iraq wartime and being willing to share their experience. Study participants were recruited by using the purposeful sampling technique. In qualitative studies, participants who have direct experience and in-depth information about the study subject are employed. Accordingly interview numbers and data saturation, selected 14 FTA expert participated in the study. Study data were collected by personal semi-structured interviews. A semi-structured interview topic guide was developed based on the research aims (22). The topic guide aimed to explore the experience of teaching FAT courses. Interviews lasted 45-90 minutes. Sampling was continued until reaching data saturation. In qualitative studies, data saturation indicate sample adequacy (22).

Interviews were recorded by using a sound recorder. Immediately after each interview, we transcribed it word for word and imported into the computer assisted qualitative data analysis software the MAXQDA 2007 to enable in-depth thematic content analysis. The MAXQDA 2007

was used to catalogue large datasets and access and code them. The conventional qualitative content analysis approach was used for data analysis. One researcher carried out all of the data analysis. Each interview transcript was reviewed several times. The researcher read through each transcript and coded sentences or paragraphs of the text under broad general headings or more specific areas. The codes were then explored in more detail, using the MAXQDA 2007 so that, codes were compared with each other and categorized according to their similarities. Categories were also compared with each other constantly and grouped into higher-level sub-categories. This technique of constant comparison was used as a means of ensuring reliability in qualitative analysis (23).

Trustworthiness i.e. the accuracy of the findings (24) is one of the most important issues in qualitative studies. The four most common criteria of trustworthiness are credibility, confirmability, reliability, and transferability. The credibility of the findings was established by adopting techniques such as constant comparison, searching for negative cases, and member-checking. For member-checking, a summary of the findings was provided to the participants and they were asked to assess the congruence between the findings and their own experiences. Moreover, two experienced qualitative researchers supervised the study. Confirmability is the ability of other individuals or parties to trace the intended researchers' activities during the study. Accordingly, the confirmability of the findings was maintained by producing a comprehensive report of the flow of the study. We also invited an external reviewer to assess the accuracy of the findings and our documentations. Transferability is defined as the possibility of transferring the study findings to other situations. Qualitative researchers provided descriptions of the findings and the data in order to enhance the transferability of their findings (23).

Study participants were informed about the aim of the study and a written informed consent was obtained from them.

4. Results

All participants were male and ranged in age from 37 to 58 with a mean of 48.74 ± 4.67 years. Moreover, the length of their service at war zones was 24-78 months with a mean of 46.14 ± 15.92 . Analysis of the study data yielded the generation of 341 primary codes, twelve sub-categories, four main categories, and two main themes. The main themes of the study were 'the congruence of FAT education and educational needs' and 'managerial engagement in FAT education'. These two themes are explained below.

4.1. The Congruence of FAT Education and Educational Needs

All participants highlighted the importance of providing educations based on educational needs. The two

main categories of this theme were using appropriate educational materials and adopting effective teaching strategies.

4.2. Using Appropriate Educational Materials

According to the study participants, FAT-related concepts need to be included in FAT courses. A participant who had a 61-month experience of medical assistance and FAT education at war zones noted that during the war, veterans were in an urgent need for receiving specialized services. Accordingly, both theoretical and practical training were designed and offered. Theoretical trainings included the definition of FAT, methods of transportation, and the basics of first aid. Our participants highlighted that considering the large numbers of victims at war zones, the most essential step in FAT was triage and prioritization. A participant who had a 36-month war experience noted that in FAT operations during Iran-Iraq war, victims were prioritized and labeled as 'Acute' or 'Outpatient' and they were transported respectively to either emergency medical service centers or field hospitals. Accordingly, appropriate prioritization resulted in appropriate transportation.

Another aspect of using appropriate educational materials was related to the basics of quick FAT. Our participants highlighted that a prerequisite to quick FAT was having a high morale and great spiritual readiness. A participant who had a 48-month experience of working as the chief of FAT education during wartime mentioned that we had an effective FAT system stating that the reason was that our FAT staffs were highly competent, physically fit, and spiritually developed. Moreover, they had high aspiration for both martyrdom and victory. Accordingly, they protected themselves and saved their fellow veterans' lives even in difficult conditions where reinforcements and munitions were not available.

Some participants also highlighted the importance of incorporating the basics of modern-warfare FAT into FAT courses. A participant who had a 50-month war experience and had served in Iran-Iraq war as the chief of the Modern Warfare Unit expressed, that in their classes, we repeatedly taught the principles of FAT in chemical warfare including personal protection, using face mask, wearing chemical-proof uniform, and using the Modern Warfare Kits. Afterwards, they taught the techniques in classes and then practiced them during maneuvers.

4.3. Adopting Effective Teaching Strategies

The second main category of the congruence of FAT education and educational needs was adopting effective teaching strategies. The sub-categories of this were practical training, field and clinical training, and maintaining the continuity of training. A participant who had a 38-month war experience and an experience in teaching noted that teaching methods were also important during the war and stressed the basics of transporting victims by

using a stretcher to paramedics, medical assistants, and evacuators. Moreover, when there was no military operations and the workload was lighter, continuing theoretical and practical training of nurses and auxiliary nurses who worked in field hospitals is essential.

Another participant who had served in the Iran-Iraq war for 78 months as a paramedic and field FAT trainer noted that teaching the basics of FAT in mountainous areas was unique. Mountain FAT staffs needed to maintain full physical fitness. Before each operation, maneuvers and principles of transporting victims by using a stretcher in upward and downward slopes are necessary.

4.4. Managers' Engagement in FAT Education

Our participants highlighted that in addition to the War Health Center which was the main body in FAT education during wartime, managers at all levels were also engaged. The two main categories of this theme were universal FAT education and specialized skill training. These categories are explained below.

4.5. Universal FAT Education

One of the key attributes of Iran-Iraq wartime FAT education was its universality. The sub-categories of this category were FAT education for managers and commanders, educating self- and fellow-FAT, and educating war-related managerial experiences via course syllabus through consulting with skilled personnel and experience. Commanders required universal self-FAT educations to all veterans. Such educations focused mainly on wound management.

Veterans learned how to save their own or their fellows' lives by using the equipment available.

4.6. Specialized Skill Training

Our participants also highlighted the importance of specialized skill training. The two sub-categories of this category were training staffs skill and the need for skilled FAT trainers. Some had received no academic FAT trainings; however, they attended FAT courses and received FAT trainings at their own provinces. They had passed at least the FAT, the Medical Assistant, the Self-FAT, or the Fellow-FAT courses. Moreover, continuing education programs were offered during Iran-Iraq war in war zones. The trainers were experienced in providing FAT services in the war zone.

5. Discussion

5.1. War-Related Experiences

This study was conducted to identify the content of the FAT course based on the Iran-Iraq war experiences. Study findings revealed that Iranian veterans of the eight-year Iran-Iraq war have valuable experience in the field of military medicine and FAT education. This knowledge and

experience can be used for improving the FAT curriculum. Previous studies also reported the same findings (18, 19). In view of the fact FAT is a component of prehospital trauma care and the training of prehospital care providers ranges from minimally trained first responders to attending physicians trained in trauma center. Because of these discrepancies in training and experience, the prehospital system needs to be carefully reviewed in the field and combat zone (25). Therefore, to use war-related experiences may be effective. Atack et al. (2000) also noted that employing skilled trainers is an essential prerequisite to effective teaching (26).

5.2. The FAT Prioritization

Study findings also revealed that the basics of triage and prioritization need to be included in FAT courses and offered in such a way that it could empower FAT staffs to quickly assess victims, identify their medical needs, determine healthcare priorities and provide first aid services based on triage including on-site transportation. Other studies determined that major trauma patients should be identified on scene, with time-critical interventions performed to save lives and allow safe transport, followed by rapid transfer to the most appropriate facility for ongoing management. Accurate triage and bypass protocols are therefore essential (27, 28). We also found that effective teaching strategies are needed for improving the effectiveness of FAT trainings. Chen et al. (2007) also reported that teaching strategies should be designed and employed according to the characteristics of the target population (29). Accordingly, FAT staffs need to receive short-term and long-term specialized FAT trainings. Yeung et al. (2008) also found that emergency nurses had precise FAT-related information; nonetheless, they needed to receive practical FAT trainings to supplement their knowledge. Our participants also highlighted the importance of continuing education programs to improve the effectiveness of FAT training. Maintaining the continuity of education is a key prerequisite to successful health education (30). Study findings also highlighted the importance of common FAT education. This is in line with the findings of Mohebbi et al. They assessed FAT services which had been provided to casualties of the Bam earthquake and found that in 65% of cases, family members had acted as the primary FAT personnel (31).

5.3. The FAT and Life Protection

Based on the pattern of injury trauma patients were may have loss of airway or breathing, life-threatening hemorrhage, chest and head injuries. The airways of severely injured patients need to be secured as soon as possible. Therefore monitoring vital signs, airway management and cardiovascular monitoring is a key component of FAT for seriously injured patients. In military medicine maintenance of blood circulation is one of the most important goals in primary care of a trauma patient. The

majority of bleeding occurs before hospitalization of the patient. Thus, the ability to stop hemorrhage from actively bleeding large arteries and veins is vital. Several physical methods are used for bleeding control such as using a tourniquet. The US military in the latest conflicts in Iraq and Afghanistan showed that tourniquets save lives in cases of severe blast injuries. These findings translated into tourniquets built into tactical gear by some manufacturers. The different types of tourniquets (rubber, cloth, and windlass) are successful in eliminating distal pulses when applied above and below the knee or elbow in limb amputation. Most bleeding from such injuries are also controllable through use of direct pressure, elevation and packing of the wound. If these actions do not achieve hemostasis, then the use of a tourniquet is indicated (32).

5.4. Quick FAT

We also found that the basics of quick FAT need to be included in FAT courses. It is now fairly well known and understood that experiencing in emergency situations, time is directly related to life. In other words, the shorter the FAT time is, the lower the casualty rate will be and a regional network of trauma care can reduce the mortality resulting from major trauma. In developed countries with mature trauma systems, further improvements in mortality rates are likely to be small. Therefore, efforts to establish the effect of trauma system care on quality of functional outcome are of key importance (33).

5.5. The FAT in Modern Warfare

In addition, we found that our participants had not received training regarding protection against chemical warfare during the first years of the war. Ahadi et al. (2002) also reported that Iranian FAT staffs had not been initially prepared for chemical warfare (34). Although the use of chemical warfare still remains a potential threat despite the CWC prohibiting their use knowledge about these agents is very important to plan a response in an emergency. If timely protective action is taken and exposed persons treated immediately, the mortality and morbidity can be considerably reduced (33).

5.6. Self-and Fellow-FAT

Accordingly, the target population FAT education should include all people in the society, particularly those who are deemed to be at greater risk. We found that FAT educations should also be provided to managers of all levels. In emergency situations, managers need to make momentous decisions. In other words, effective and wise decision making is among the key requirements for FAT success. However, experience shows that most fatal errors usually occur in critical situations, i.e. when individuals cannot make informed and intelligent decisions. Accordingly, educating the basics of FAT to managers can improve their decision making ability in emergency situ-

ations. Study findings indicated that another component that should be incorporated into FAT courses was war-related managerial experiences. Some also noted that using managers' experiences can enhance the effectiveness of FAT education (35). Moreover, specialized skill training was also highlighted by our participants as one of the key components of FAT courses. Hudson et al. (2010) also found that providing pre-hospital intensive care is among the main tasks of FAT personnel (36).

5.7. The FAT Curriculum

We developed a FAT course curriculum based on the

findings of the study (Table 1). Providing short- and long-term FAT educations by using the developed FAT course syllabus is recommended.

The wartime FAT course had been developed based on the real needs of veterans and it included both theoretical and practical trainings. Moreover, study findings highlighted the necessity for revising FAT course syllabus based on clients, veterans, and managers' needs. We developed and provide specific guidance of FAT curriculum. This curriculum is recommended for educating FAT personnel, paramedics, emergency technicians, and military nurses.

Table 1. A First Aid and Transportation Course Syllabus Which Was Developed Based on the Study Finding^a

Basic Concepts of FAT

Defining the concepts

First aid, transportation, techniques for FAT, equipments for FAT (stretchers, ground transportation equipment, air transportation equipments)

Life protection

Monitoring vital signs (heart rate, blood pressure, temperature, respiratory rate, pupil changes)

Airway management (maintaining a patent airway and adequate airway clearance, artificial ventilation, managing a foreign body airway obstruction, inserting intratracheal tube and providing mechanical ventilation and etc.)

Cardiovascular monitoring (managing external bleeding, chest compression, assessment and management of internal bleeding, preventing shock, establishing intravenous line, fluid therapy)

Adminstrating first aid (shock management, splinting fractured bones, managing spinal and head injuries, managing chest injuries)

Victim transportation

1. Assessing climate conditions; 2. Assessing available sources and equipments; 3. Considering other potential hazards; 4. Triage and prioritization; 5. Ground transportation; 6. Air transportation

Quick FAT

Motivating staffs

1. How to keep and show patience; 2. How to be energetic and empathetic; 3. Showing commitment to the aims and aspirations; 4. Feeling responsibility and having limited expectations

Appropriate FAT services

1. Self-FAT; 2. Fellow-FAT; 3. Evacuation sites; 4. FAT centers; 5. Emergency centers and filed hospitals

Prioritization

FTA prioritization

1. On-site triage; 2. Transportation triage; 3. Using standard tags; 4. Hospital triage; 5. Triage systems

FAT in modern warfare

Protection against modern weapons

1. Preventive measures including early arrival at contaminated areas; 2. Discovering polluting agents; 3. Decontamination; 4. Informing; 5. Leaving polluted areas; 6. Preventing contamination; 7. Self-protection strategies (such as wearing face mask and chemical proof uniforms, removing contaminated clothes); 8. Using the first-aid kit; 9. Self-treatment; 10. Appropriate use of equipments

Self- and fellow-FAT

Self- and fellow-FAT

Life support strategies; managing bleedings; managing (head, chest, spinal, and abdominal) injuries; shock management; acute diseases and modern warfare; transportation techniques

Educating FAT to managers

Appropriate use of staffs and equipments

Appropriate use of evacuators, FAT staffs, physicians, nurses, and ambulance staffs and drivers, allocating staffs to small FAT units, and appropriate use of first-aid kit, FAT backpack, and FAT equipments

Educating war-related managerial experiences

Competent FAT commanders

Using experience, Supervision and control, innovation in transportation, using effective communication system, being competent and skillful, having great decision making ability, being active and ready

^a Abbreviation: FAT, first aid and transportation.

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Authors' Contributions

Study concept and design: Hamid Reza Gholami, Forogh Sarhangi; acquisition of data: Hamid Reza Gholami; analysis and interpretation of data: Forogh Sarhangi, Dr. Morteza Khaghanizade; drafting of the manuscript: Hamid Reza Gholami, Soheil Najafi Mehri; critical revision of the manuscript for important intellectual content: Forogh Sarhangi, Dr. Morteza Khaghanizade.

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