Emergency Medical Systems:

Prehospital Trauma Care for Landmine and Ordnance Blast Injuries in Afghanistan

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ABSTRACT

A formal training program with theoretical and practical components is essential for all emergency medical personnel involved in providing care for critically injured patients. Communication, effective first aid, and on time transportation to a health center play a major role in improving quality of care for critically injured patients. Using lifeexperience examples, participants in the study emphasized the importance of each factor on the delivery of quality care for critically injured patients. Recommendations based on the study findings, included two main categories. The first category illustrated recommendations to stakeholders, and the second category reflected recommendations for further study. Stakeholders in this study included healthcare leaders in Afghanistan, healthcare professionals involved in providing health care in Afghanistan, and local people in Afghanistan. The modified van Kaam method in the qualitative phenomenological study involved conducting semistructured interviews, which were audio-taped and transcribed. The rationale for using the phenomenological approach in the qualitative study was to describe in-depth experiences of health care professionals. Moustakas' (1994) modified van Kaam method explored the lived experiences and perceptions of 17 doctors and nurses relating to emergency trauma care for critically injured patients. Data analysis revealed important factors that could enhance the quality of prehospital care for civilian casualties of landmine and unexploded ordnance (UXO) blast injuries in Afghanistan. The four major themes that emerged from participants' responses to interview questions included communication, formal training for emergency medical personnel, transportation to a higher-level center, and quality of prehospital care.

DEDICATION

I dedicate this dissertation to my family especially my parents Professor Ahmad Shah Jalal and Fazelah Omary- Jalal who provided support and encouragement in moving forward with my decision of getting the highest education possible.

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CHAPTER 1: INTRODUCTION

Emergency medical systems provide sustainable, lifesaving first aid to most trauma patients before they reach a medical facility (Guoxin, 2008). Prehospital emergency medical services have a direct impact on patients' mortality and morbidity rates. The caliber of prehospital emergency medical care affects the quality of subsequent clinical services (Centers for Disease Control and Prevention [CDC], 2008).

Obtaining accurate statistics on most blast injuries is difficult due to the chaotic environment surrounding such injuries (Greer, 2007). The major causes of blast injuries are industrial accidents, war activities, terrorist attacks, or repeated exposure to highenergy industrial equipment. Greer explained that a primary blast injury (PBI) results from direct interaction with and transmission of pressure waves through the body, which mostly affect the lungs and other air-filled organs. Blast injuries can be fatal even when patients do not exhibit external damage if healthcare professionals do not diagnose and treat the patients in a timely manner.

The focus of this qualitative phenomenological study was to explore how healthcare leaders can improve the quality of emergency health care for civilian casualties of landmine and unexploded ordnance (UXO) blasts in Afghanistan. The latest study on landmine and UXO injuries in Afghanistan indicated that the number of children and adults injured is rising (Bilukha, 2007). The increase in the number of injured individuals in Afghanistan contrasts with other countries, such as Chechnya, where the number of injured decreased rapidly after the end of active war.

In-depth interviews with medical professionals, 17 physicians and nurses, yielded information on how to improve the quality of emergency health care for civilian

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casualties of landmine and UXO blasts in Afghanistan. The 20 physicians and nurses have experience treating civilian casualties in Afghanistan, or other developing countries with similar problems, as well as in industrial countries. Chapter 1 illustrates the background of the problem, problem statement, purpose, significance of the study, and significance of the study to leadership. The chapter further includes an explanation of the nature of the study, theoretical framework, research questions, definitions, assumptions, limitations, and delimitations, concluding with a summary.

Background of the Problem

Decades of political turmoil in Afghanistan have eroded the country's infrastructure and resulted in significant humanitarian and military changes (Saguil & McCormack, 2008). The healthcare system and accessibility to emergency care reflect significant setbacks. In 2004, the Afghan Ministry of Public Health (MoPH) reported that scarce economic and intellectual resources had resulted in inequitable distribution of quality health services in all aspects of the healthcare system in the country (World Health Organization [WHO], 2005). The fragmented healthcare system in Afghanistan has further jeopardized the accessibility of injured patients to timely health services, particularly in remote areas.

CDC (2008) recommendations to prehospital emergency medical services for mass casualties during blasts include the following:

- 1. Find the victims of major blast-related injuries.
- 2. Communicate clearly with acute care medical and emergency management resources.
- 3. Implement timely triage to match accessible resources with the patients' injuries.

Emergency trauma care requires initial assessment and management of injured patients by trained healthcare professionals (Guoxin, 2008). Effective first aid soon after injury can increase survival rates of patients injured by landmine and UXO blasts.

More than 12 million landmines and UXOs in Afghanistan are threatening civilians' lives and safety every day (Afghanistan Technical Consultants [ATC], 2007). Despite international efforts, 50% of the individuals injured by a landmine explosion lose their lives before receiving emergency care (E-mine, 2006). The devastating effect of landmine injuries on Afghan people's lives illustrates the need for an effective emergency medical system. Timely first aid and emergency care can save lives and improve recovery time.

Guoxin (2008) noted two main components of prehospital trauma care: Field stabilization and rapid transportation of patients to trauma centers. Field stabilization prior to transportation involves restoring the respiratory system through intubation and raising the blood pressure through intravenous fluid. Patients with blast injuries sustain a variety of trauma to vital organs that require immediate expert medical attention.

According to Guoxin (2008), first aid at the scene of explosion is vital for critically injured patients but rapid transportation to a medical facility is the next important life-saving step. Emergency medical care for patients with landmine blast injuries in Afghanistan is an issue of growing concern among national and international communities. The primary focus of the phenomenological study was to evaluate prehospital care for critically injured patients by landmine and ordnance blast injuries in Afghanistan. Landmines and UXOs on military land and farms kill or injure an average of 62 Afghans each month (E-mine, 2006). Blast injury often occurs when victims tamper with UXOs to sell the metal for profit. Most of the injured individuals are male, and approximately 50% are children. The problem is that the lack of a sustainable emergency medical system for blast injuries deprives patients of timely, lifesaving first aid. Barriers to the delivery of efficient and effective emergency health services result in high mortality rates in blast-injury patients.

Landmines threaten Afghans with death or dismemberment and interfere with farming and reconstruction works in the country (E-mine, 2006). Of the 34 provinces of Afghanistan, 32 contain mines, and 75% of the affected communities reside in 12 provinces. According to the Landmine Survivors Network (2001), Kabul is one of the most heavily mined capital cities in the world. One of the largest cities in Afghanistan, Kabul is home to 3,199,091 people ("Islamic Republic of Afghanistan," 2008).

Landmine and UXO blast injuries have a complex nature and can cause associated damage to vital organs, which may not be apparent at first (Alfici, Ashkenazi, & Kessel, 2006). Traumatic brain injury (TBI) and injuries to the respiratory system, such as tracheobronchial injuries, are among the life-threatening conditions that require immediate diagnosis and treatment. Both blunt and penetrating forces can cause tracheobronchial injuries, but early diagnosis and therapeutic intervention can save lives (Balci, Eren, Eren, & Ulku, 2002; Wong & Knight, 2006). An emergency cricothyrotomy is another lifesaving procedure used to open an injured airway (Macdonald & Tien, 2008). Military medics practice the cricothyrotomy procedure on simulators and animal models before deployment. Similarities between managing trauma in warzones and civilian settings exist (Macdonald & Tien, 2008). In remote rural areas and under harsh climates where rescue teams need to address critical injuries without access to specialists, trauma practitioners require enhanced trauma-management skills. Trauma practitioners may attend training courses to enhance their skills. The American College of Surgeons offers such courses, which include advanced trauma life support and rural trauma team development.

Nongovernmental organizations (NGOs) have provided most of the emergency care over 3 decades of war. The NGOs or international committees include the International Committee of the Red Cross (ICRC), the International Medical Corps (IMC), Management Sciences for Health (MSH), and Doctors without Borders/Medecins Sans Frontieres (MSF). Although the organizations provide significant care for injured civilians during war conflicts, they leave the areas after formation of a government. MSF left Afghanistan in 2004 after the death of five of their team members (Doctors without Borders, 2006).

Kabul, the capital of Afghanistan, and its outskirts contain many landmines (Landmine Survivors Network, 2001). The United Nations (UN) demining program indicated that Kabul is the most heavily mined capital city in the world. About 800,000 individuals, or 4% of Afghanistan's population, are disabled, and among them, more than 200,000 exhibit disabilities because of landmine and UXO blasts. Healthcare leaders on both the national and international level are increasingly concerned about civilian casualties due to landmines and UXOs in Afghanistan.

Statement of the Problem

Lack of a sustainable emergency medical system for blast injuries deprives patients of well-timed, lifesaving medical care in the field. Barriers to delivery of efficient and effective emergency health services result in high mortality rates in blastinjury patients (Kondro, 2007). The quality of emergency care for landmine and UXO blast-injury patients in Afghanistan increasingly concerns healthcare leaders. Evaluating the effectiveness of provided care, patient safety, and promptness of care is essential to measure quality of health care and identify disparities (Brady, Ho, & Clancy, 2008). The specific problem of the study was to assess effective prehospital care for landmine and UXO blast-injury patients in Afghanistan.

Critically injured patients often do not receive lifesaving treatment because they drain the resources and minimize the chances of less seriously injured patients receiving treatment (Kondro, 2007). Landmines and UXOs kill or injure an average of 62 Afghans each month (ICRC, 2007). Despite international efforts, 50% of patients injured through landmine and UXO blasts in Afghanistan die before receiving emergency care (Bilukha, 2007; E-mine, 2006). A qualitative phenomenological study aided in exploring how healthcare leaders might improve the quality of emergency health care for civilian casualties of landmine and UXO blasts in Afghanistan. The population for the phenomenological research study included the sample of 17 drawn from physicians and nurses who were involved in treatment of emergency trauma patients in Afghanistan or other developing countries as well as industrial countries.

A qualitative phenomenological method and design were appropriate for the research study because a phenomenological framework is useful in gaining in-depth information from the real-life experience of participants. Data analysis aided in answering research questions. In a qualitative phenomenological study, to answer the research question, the researcher gathers data through interviewing participants about their experience with a specific real-life phenomenon (Creswell, 2005).

Purpose of the Study

The purpose of the qualitative phenomenological study was to explore how healthcare leaders might improve the quality of emergency health care for civilian casualties of landmine and UXO blasts in Afghanistan. Presenting healthcare professionals' expert opinions may guide healthcare leaders to improve the quality of emergency services for blast-injury patients. A qualitative purpose statement involves seeking participants' experience (Creswell ,2005).

Data collection involved a modified van Kaam method by Moustakas (1994) with audio-taped and semistructured interviews. The interview questions aided in exploring the participants' in-depth experience with the phenomenon of emergency trauma care. To validate the interview questions, three volunteers with experience in treatment of emergency trauma patients in developing, developed, and industrial countries participated in a pilot test. Data analysis involved the use of the NVivo8 qualitative computer software application.

The population sample consisted of a purposeful selection of physicians and nurses who lived in various geographical locations and could promote an understanding of the central phenomenon of the study. The basis of sampling in a qualitative study is the familiarity of participants with the central phenomenon (Creswell, 2005). Data collected in qualitative studies are general and emerge from text or images. A small number of individuals or sites provide the data. One-on-one interviews may include face-to-face, telephonic, electronic mail (e-mail), or mail contact depending on availability.

The geographical location of the phenomenological study depended on participants' location. Participants worked with different healthcare organizations in the United States or Europe. Most participants were traveling to different parts of the world, including industrial, developed, or developing countries, to provide emergency healthcare services.

Significance of the Study

Landmines and UXOs are a serious public-health danger in Afghanistan. The four essential values of human rights law, "dignity, autonomy, equality, and solidarity" (Mercer & McDonald, 2007, p. 549), might have less meaning to the injured patients and their families. Acute trauma services for patients injured by antipersonnel (AP) landmines and UXOs in Afghanistan are the main concern for healthcare leaders at national and international levels.

Although an estimated 905 active healthcarefacilities operated in Afghanistan between 2001 and 2003 (Bilukha, Brennan, & Woodruff, 2003), the survival rate remained unchanged. Half of injured individuals lose their lives due to lack of accessibility and transportation; other injured patients face severe disability and disfiguration. According to Bilukha et al., without proper treatment, the injured patients will not be able to live independently or support their families.

The main responsibility of healthcare leaders is to have an effective plan in place in case of national emergency and mass casualty. Proactive team building and collaboration among clinical and nonclinical staff are essential. Extreme action teams are an example of the resources necessary during mass casualties. During wartime or natural disasters, an urgent need for leadership of extreme action teams exists (Klein, Ziegert, Knight, & Yan, 2006).

Each year, landmines and UXOs cause up to 20,000 new casualties, and often patients die from the blast because they do not receive timely, proper care (Landmine Action, 2007). Approximately 85% of injured children die before reaching a hospital. Landmine explosion survivors suffer a variety of debilitating injuries, such as blindness, loss of limbs, burns, and shrapnel wounds.

Three decades of war have resulted in horrific and disruptive effects on Afghan people's lives. Such effects include displacement of people and destruction of capital and infrastructure (Saguil & McCormack, 2008). Disruptions occurred in schools and affected education. The majority of the people earn a living through agriculture and farm labor. Landmines and UXOs resulted in two major obstacles in the daily life of Afghanis: (a) mines infested farming lands, and (b) surviving farmers suffered crippling injuries.

Significance of the Study to Leadership

Healthcare leaders in Afghanistan and other parts of the world express deep concerns regarding the devastating injuries caused by landmines and UXOs. Several NGOs have provided help for landmine blast patients in Afghanistan. Courageous healthcare leaders, such as MSF, have placed their safety at risk by volunteering to go to Afghanistan to help individuals with landmine blast injuries. MSF left Afghanistan in 2004 after the death of five of their team members (Doctors without Borders, 2006). The ICRC (2007) is one of the international committees that has facilitated the support of healthcare leaders in Afghanistan since 1987 for landmine and UXO blast injuries and has provided support for selected hospitals.

Leaders may find the study significant because the research involved exploring innovative methods to help healthcare leaders assist patients injured by landmines and UXOs. Creative and critical methods, such as healthcare leaders using tele-education and tele-medicine to aid local providers, may improve the quality of emergency care for injured patients. The results of the study apply not only to landmine blast injuries but also to other injuries that require the same degree of emergency care.

Healthcare leaders in all disciplines treating emergency trauma patients may be able to implement the quality improvement methods that resulted from the study. The research study also involved exploring proactive team building and collaboration among clinical and nonclinical staff, which are important elements of quality care. The goal of the study was to promote effective and timely emergency care for landmine and UXO blast-injury patients in Afghanistan. The results of the research study illustrated the importance of extreme action leadership components (Klein et al., 2006), such as contingent leadership, situational leadership, functional team leadership, and shared team leadership.

Nature of the Study

The research took the form of a qualitative phenomenological study. Cooper and Schindler (2006) indicated, "Qualitative research methodologies have roots in a variety of disciplines, including anthropology, sociology, psychology, linguistics, communication, economics, and semiotics" (p. 196). Qualitative research was appropriate for the research

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study because the intention behind such research is to understand participants' points of view of phenomena or social realities (Leedy & Ormrod, 2005).

Quantitative research involves implementation of a preplanned and fixed structure (Creswell, 2005), which was not suitable for the phenomenological study. A quantitative study includes careful evaluation of data to determine distribution and correlation of key variables before researchers start the analysis. The evaluation often results in restating the research questions and the literature review because the structure of the study could change in response to data. Quantitative study designs may not include rich and open-ended discussions to describe an individual's experiences and perceptions (Wilding & Whiteford, 2005).

Leedy and Ormrod (2005) explained phenomenology as referring to "a person's perception of the meaning of an event, as opposed to the event as it exists external to the person" (p. 139). Obtaining an in-depth understanding of different healthcare professionals' experience with management of civilian casualties of landmine and UXO blasts was possible using the phenomenological design. A phenomenological study may add to the richness of information obtained from different sources.

In qualitative studies variables are rarely used to convert social life into numbers instead researchers place borrowed ideas from participants within context of natural setting (Neuman ,2006). In qualitative research themes, distinctions, and ideas are examined instead of variables (Neuman). Understanding the participants' experiences may assist healthcare leaders to improve the morbidity and mortality rates of civilian casualties in Afghanistan. Implementing effective prehospital and acute trauma services based on participants' in-depth experience with complex trauma treatment may strengthen the survival rate of civilian casualties in Afghanistan.

Grounded theory, another qualitative design, was applicable to the phenomenological study because grounded theory involves creating a theory to explain a central phenomenon (Creswell, 2002). In grounded theory, the researcher moves from specific theory to general, but when searching for the roots of a problem, the phenomenological method is preferable (Shank, 2006). According to Creswell (2005), grounded theory design offers a macropicture rather than a microanalysis with details of certain situations. A weakness of the grounded theory design in relation to this phenomenological study would be using predetermined analytic categories that may not fit the individual's experience or perception (Creswell, 2002).

A case study design, another qualitative method, may have aided in answering the research questions but was not appropriate for the study because the case study does not allow for a search for meaning units as Leedy and Ormrod (2005) described. Integration of the meaning units into lived experiences of participants was possible through the phenomenological method. Speziale and Carpenter (2007) claimed that use of Moustakas' modified van Kaam method is widely accepted in qualitative research. A semistructured interview (audio-taped and transcribed) with 20 participants allowed for the emergence of major themes to answer the research questions.

The purpose of the qualitative phenomenological study was to explore how healthcare leaders might improve the quality of emergency health care for civilian casualties of landmine and UXO blasts in Afghanistan. Healthcare professionals involved in emergency trauma care in Afghanistan or other countries may provide healthcare