



Research Article

Experiences Living with Fatigue in Iranian Veterans Chemically Injured by Sulfur Mustard Gas: A Phenomenological Study

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SUMMARY

Purpose: Fatigue affects the quality of life. Evidence shows that the phenomenon of fatigue is experienced differently depending on the type of disease and its consequences. The aim of the study was to explicate the meanings of the experience of living with fatigue in chemically injured veterans.

Methods: The hermeneutic phenomenology approach was used in this study, with an emphasis on Van Mennen's viewpoint and approach. According to Van Mennen, six overlapping dynamic activities are recommended to conduct a phenomenological study. During unstructured interviews, the participants were asked to describe their daily living experiences with fatigue. The participants were individuals who were chemically injured due to exposure to mustard gas. After examining every statement in the interview text, extractions of the meaning units, clustering, and themes were performed.

Results: The data explication was based on the third to sixth stages of Van Mennen's approach. The experience living with fatigue was classified into four essential themes: fatigue as a chronic condition, as an unstable and affected situation, as a physical condition of the entire individual, and as a mental condition of the entire individual.

Conclusion: Due to unique social interactions and pathogenicity, victims of mustard gas experience fatigue differently than patients with other chronic diseases.

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Introduction

From 1985 to 1990, more than 3,400 people suffered injuries, including respiratory (42%), ocular (39%) and skin complications (25%), as a result of Iraqi chemical attacks against Iranian soldiers and civilians (Khateri, Ghanei, Keshavarz, Soroush, & Haines, 2003). Due to the occurrence of late respiratory complications of mustard gas exposure, 20 years after this incident, the number of chemically injured victims has been reported at least 45,000 people (Ghanei & Harandi, 2008).

Although early and late pathophysiological outcomes of mustard gas exposure have been considered in terms of the

physical aspects of the injured victims (Aghanouri et al., 2004; Ghanei & Harandi, 2008; Ghanei et al., 2008; Pourfarzam et al., 2009; Shohrati, Ghanei, Ali, & Navab, 2008), outcomes that affect the quality of life, daily activities and care and rehabilitation programs have received little attention. Several articles have stated that fatigue is one of the consequences and complications of mustard gas exposure (Berahmani, Abed Saeidi, & Kheiri, 2004; Ghazanfari et al., 2009; Pirasteh et al., 2009). Fatigue also causes a reduction in the physical daily activities of chemically injured veterans (Ghazanfari et al.). When the physical abilities of an individual are reduced due to chronic disease, their existential foundation is damaged, which may decrease their confidence and physical and mental abilities (Corbin & Strauss, 1987). Measuring the amount of fatigue with multidimensional questionnaire reveals that chemical victims suffer from fatigue with the score of more than average in their daily life, and that, this fact is directly related to the severity of the respiratory

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disease status (Najafi Mehri, Pashandi, Mahmoodi, Ebadi, & Ghanei, 2010). Although chemically injured veterans complain of fatigue and exercise intolerance in their activities in everyday life (Tavalaei et al., 2007), no studies in the scientific literature have examined the nature of this phenomenon and the experience of living with fatigue among chemically injured veterans. It has reported a decrease in the quality of life among chemically injured veterans, based on questionnaires examining scores for physical activity; it has also found the reduced physical activity of these veterans with respect to fatigue (Salari, Mahdizadeh, Ebadi, Aslani, & Naderi, 2009). The causes and symptoms of fatigue differ as a result of the variety of chronic disorders suffered by chemical injury victims. For example, does fatigue differ between chemically injured veterans and patients suffering from respiratory diseases, cancer and rheumatoid arthritis? What is the experience living with fatigue in chemically injured veterans? The evidence shows that the phenomenon of fatigue is defined and experienced differently depending on the type of disease and its consequences on the patient (Olsson, Lexell, & Soderberg, 2005).

Fatigue

Fatigue is one of the most common problems in primary care. Fatigue is considered a main complaint in 5–10% of patients and a major secondary symptom in another 5–10% (Sharpe & Wilks, 2002). Although accurate statistics on the prevalence of fatigue in chemically injured veterans have not been reported, fatigue has been reported to have frequency rates of 22% and 18% in samples from Norway (Loge, Ekeberg, & Kaasa, 1998) and England (Pigeon, Sateia, & Ferguson, 2003), respectively.

There is no clear agreement regarding the definition of fatigue in scientific studies. Some studies distinguish normal fatigue from mental and pathological fatigue, whereas others consider acute fatigue to be common and chronic fatigue to be pathological. From a general physiological viewpoint, fatigue is defined as a type of physical and mental failure, such as the inability to carry a load or to perform physical exercise (Evans & Lambert, 2007). From a psychological perspective, fatigue is considered a biological and psychological phenomenon that is associated with subjective feelings of inability, lack of energy, cognitive impairment, and behavioral dysfunctions (Boksem & Tops, 2008; Marcora, Staiano, & Manning, 2009). As a nursing diagnosis, fatigue is defined by the North American Nursing Diagnosis Association as "An overwhelming sustained sense of exhaustion and decreased capacity for physical and mental work at the usual level" (Doenges, Moorhouse, & Murr, 2008).

Regardless of the cause of fatigue, some researchers believe that fatigue is a concept that may be understood differently in various patients and professions (Ream & Richardson, 1996). These different perspectives are significant, especially with respect to the communication between nurses and patients. Therefore, it is necessary to grasp the meaning of fatigue among different patients as participants of phenomenology research.

The consequences of fatigue include reduced capacity and a lack of energy. The symptoms of fatigue include the inability to maintain and regulate the body's stability and a lack of capacity due to physical, bio-environmental and physiological factors. Because of the effects of fatigue on the quality of life, an accurate understanding of the concept of fatigue and a definition of its causes and measurable outcomes are necessary (Choi & Song, 2003). For people suffering from specific diseases, fatigue is an uncomfortable and annoying symptom. Fatigue has been mentioned and measured as a major problem in patients suffering from cancer (Gonzalez & Gorini, 2008), respiratory diseases (Small & Lamb, 1999), rheumatoid arthritis (Repping-Wuts, Hewlett, van Riel, &

van Achterberg, 2009), neurological disorders (Chaudhuri & Behan, 2004; Ford, Trigwell, & Johnson, 1998), renal disease (Mollaoglu, 2009) and chemical injuries (Berahmani et al., 2004; Tavalaei et al., 2007).

As a member of the medical care treatment team, nurses play a fundamental role in the development and implementation of care and rehabilitation programs for chronic patients. To establish a nursing diagnosis of "fatigue", planning, implementing and evaluating the patient's care is essential. This diagnosis suggests that fatigue is a "sustained sense" of mental and/or physical exhaustion with a subjective origin. How do chemically injured veterans experience fatigue? This study was performed to explicate the meanings of the experience of living with fatigue in the chemically injured victims of mustard gas.

Methods

Study design

Phenomenological approach: One of the most appropriate methods to assess the phenomenology of the living experience is qualitative research using a hermeneutic phenomenology approach, which can explain the meanings and concepts of a phenomenon by reflecting on the real experiences of people (Mackey, 2005; Van Manen, 1997). Hermeneutic phenomenology has been recognized as a suitable method for studying phenomena related to nursing activities (Giorgi, 2000). Therefore, the hermeneutic phenomenology approach was used in this study, with an emphasis on Van Mennen's viewpoint and approach (Dowling, 2007).

According to Van Manen (1997), six overlapping dynamic activities are recommended to conduct a phenomenological study. This approach involves six major activities: (a) orienting toward and becoming preoccupied with a particular phenomenon; (b) seeking and expressing (through an ontological search) the phenomenon as it exists apart from the researcher's conceptualization; (c) contemplating inherent themes (phenomenological interpretation) that demonstrate the characteristics of the phenomenon; (d) analyzing by implication (transcribed analysis); (e) describing the phenomenon using art and creativity by rewriting, establishing and maintaining a strong and conscious relationship with the phenomenon; and (f) matching the context or field of research by continuously considering the components and the whole (Jorgensen, 2006; Van Manen).

Participants

The participants in this study were individuals who were chemically injured by mustard gas. All participants were considered chemically injured veterans of more than 25 years based on authentic documents from the medical commission. Due to the incidence of delayed symptoms arising from their experiences, the participants were treated for chronic respiratory diseases. In total, nine men between the ages of 42 and 53 years who had at least 25 years of history as chemically injured veterans participated in this study; they provided informed consent.

Data collection

In this study the researcher was the main research tool or primary data-gathering instruments. In fact the interviews put the researcher in the role of research instrument through which data is collected (Streubert & Carpenter, 2011). In the unstructured interviews, the participants were asked to describe their daily living experiences with fatigue. Narrative interviews are an appropriate method for disclosing the meaning of lived experience (Lindseth &

Norberg, 2004). The researcher encouraged the interviewee to narrate, as freely as possible, about his lived experience of the fatigue. The hope was that the narrator would become engaged in his narrative and almost forgot about the interviewer. The interviewer asked questions aimed at encouraging further narration such as, "Would you please describe it more?", "How?" and "May I have an example?" The participants were guided to clarify and describe the phenomena or the mentioned variables.

In three cases, the interview was conducted in a hospital ward. The remaining interviews were conducted at the participant's workplace or house. The duration of the interviews ranged from 45 to 60 minutes. All interviews, which were done only by one of the research team members, were digitally recorded and transcribed by the researcher on the same day (Burnard, 2004). Word processing software was used to rewrite the transcriptions for analysis using MAXQDA (VERBI GmbH, Berlin, Germany), a qualitative data analysis software.

Research trustworthiness

Trustworthiness of a research study is important for evaluating its worth. According to Lincoln and Guba's Evaluative Criteria, trustworthiness involves establishing credibility, transferability, dependability, and confirmability (Guba & Lincoln, 1985). Lincoln and Guba describe a series of techniques that can be used to conduct qualitative research that achieves the criteria they outline (Denzin & Lincoln, 2011). Member checking, inquiry audit and external audits are used for establishing trustworthiness of this research.

Ethical considerations

This study was approved by 357th Research Council and 25th Ethics Committee of Baqiyatallah University of Medical Sciences. It was conducted in accordance with accepted national and international standards. The aim of the study and the confidentiality of the data resulting from the study were explained to the participants. Informed consent was obtained prior to their participation in this study to conduct and record the interviews. The participants were able to end the interview or leave the study at any time.

Data analysis and explication

In this study, the data explication was based on the third to sixth stages of Van Manen's approach (Crist & Tanner, 2003). In qualitative studies, the use of the term "data analysis" should be avoided. The term "analysis" means a "breaking into parts" and the desired components may be missing. Therefore, using the term "explication" means an investigation of the constituents of a phenomenon while maintaining the context of the whole (Groenewald, 2004). After transcribing each interview, the text was imported into the MAXQDA.

By reading the text of each interview as a whole, an interpretive summary (holistic approach) was developed. More specifically, the researcher looked at every statement of the interview text that was relevant to the question asked in the study. Next, meaning units were created. These meaning units were then clustered together into categories; *themes* were created by looking across categories.

The emerging meaning units were confirmed by reciprocally reviewing the interview texts and extracted content through collaborative reflection with supervisors and consultants and, in some cases, through discussions with the participants. By using the free imaginative variation, some incidental themes were distinguished from essential themes. Themes that were unrelated to the research question were excluded.

Results

The participants in this study described their experiences of fatigue and its impact on their daily lives. The living experiences were classified into four essential themes (Table 1).

Fatigue as a chronic condition

From the chemically injured veterans' point of view, fatigue is a chronic condition and a progressive disease that can be increased by certain factors. In their experience, there has never been a period without fatigue. However, there are strategies to control its intensity: "Fatigue is persistent. Sometimes, it may become a little less, but it's continuous. I just want to instill to myself that I'm not tired, but I see I am really tired." (Participant 9).

The chronic nature of fatigue was expressed by reductions in physical strength and power. Fatigue even decreases positive sentiments toward traveling and mobility among chemically injured veterans. Compared with their present status, in the years before and just after their injuries, the victims experienced physical changes or reductions in their ability to perform activities that they believed were due to the chronic nature of fatigue:

Well, as someone who has stayed at home for 20 years and has received drugs for nights and days, eventually I got tired of this situation. I used to travel. But a few years ago, slowly and day after day, the situation got worse. And now I only go to the hospital two or three times a year. (Participant 3)

There are many times I just wanted to do something, but I couldn't. (Participant 9)

An unsteady and affected situation

The experience of fatigue in chemical warfare victims was intensified by unsteady factors. Some of these factors are a function of the time of occurrence, whereas others are categorized as physical, psychological or environmental factors. Fatigue may be intensified during certain periods each day. For example, after a long day of performing many activities, physical exhaustion and muscle spasms were common experiences among some chemically injured veterans: "In the afternoon and early evening, I may feel tired." (Participant 4) "Especially, I feel pain in my legs. At night, close to the morning, my muscles ache, and I feel more fatigue." (Participant 7).

Although aging occurs in all groups of people and causes physiological changes, the chemically injured veterans emphasized a greater influence of aging on their fatigue than experienced by other people: "Of course, aging can be a problem by itself, but compared to the others and due to the aging, I have more problems

Table 1 Themes of Experience Living With Fatigue in Iranian Veterans Chemically Injured by Sulfur Mustard Gas

Themes	Cluster of meaning units
1. Fatigue as a chronic condition	Gradual reduction in the incidence of physical ability, reduction in capabilities, greater incidence of severe physical changes during activity than before, chronic nature of fatigue
2. An unsteady and affected situation	Time of occurrence, physical factors, psychological factors, environmental factors
3. Physical concerns	Respiratory dysfunction, reduction in energy, changes in muscle tone Sleep disorders and restless legs at night, changes in voice tone
4. Mental concerns	Mental fatigue, emotional reactions

than other people do, and I have experienced many changes.” (Participant 6).

In contrast, some physical factors may cause and intensify fatigue in other patients and in healthy individuals, but chemically injured veterans may have a decreased tolerance threshold even for basic physical activities, such as walking, eating, exercising and daily activities at work: “In my experience, I understood that I shouldn’t eat foods that are difficult to digest. For example, beef is a kind of meat that is difficult to digest. So I don’t eat meat too much. Due to that, my body is faced with a lack of protein.” (Participant 3).

In addition, mental and emotional factors, such as workplace stress, anxiety, anger, and a lack of respect, and environmental factors, such as pollution and changes in temperature, may intensify fatigue in chemically injured veterans: “When I’m even a little anxious, it makes me tired and short of breath. At least, that is the way I feel.” (Participant 1) “When I’m at work, I have a lot of stress, and this makes me feel tired.” (Participant 9) “When I was at the university and I had a lot of work to do, I felt very tired. My friends said that it was because of my difficult working conditions. I felt so sick that I needed to be taken to the hospital by ambulance.” (Participant 6).

Physical concerns

The participants used their own words to describe their experiences living with fatigue and to define their physical signs, symptoms and causes of fatigue. In expressing these symptoms, the participants noted the impact of the occurrence of these symptoms on the development of their fatigue. They also believed that the fatigue and their symptoms could not be distinguished from each other: “Due to a severe cough, I felt pain in my chest. And I got a terrible headache, and then I got so tired.” (Participant 5) “I usually felt tired due to shortness of breath.” (Participant 8).

Signs of physical fatigue are not limited to respiratory changes. Changes in peripheral muscle strength and power indicate neuromuscular system involvement in the fatigue experience. Some participants described symptoms of the lack of nerve and muscle coordination in their experiences of fatigue:

When I usually get tired, my legs get painful. From my knee to the bottom of my leg, I feel pain and fatigue. But it’s not only about my legs. It moves to other parts of my body. Sometimes I feel such fatigue in my hands. So I have to move myself in order to control the pressure on my body. For example, when I eat I feel that I’m tired. (Participant 3)

When these episodes occur for me, I lose my control and accuracy. Due to this problem, most of the time, the glass falls from my hand. This occurs during the most in stressful situations or when I’m under pressure and tired. I feel that it gets worse when there is more air pollution. Especially when I want to do something very quickly, I have no nerve-muscle coordination. (Participant 5)

Most of the participants were aware of many disturbances in their daily activities due to a lack of energy, general weakness and physical disability. They may interpret these disturbances as physical fatigue:

When I want to move, I feel so faint that I cannot even walk, as if a heavy weight is attached to my legs. (Participant 9)

I used to be very active and liked to exercise ... Even after treatment, I did not reach 50% of my previous capacity, and now this number is less than 35%. For example, when I’m playing

Ping-Pong or when I’m repairing my car, I feel severe pain and fatigue in my muscles and become restless with this exhaustion at night, and I cannot bear it. It’s like my muscles don’t work properly, and my muscles lose their power and strength. (Participant 7).

Other patients noted changes in the quality of their voice and its volume due to fatigue: “Now I have lost my voice (clearing his voice). It’s because of tiredness. I cannot talk too much.” (Participant 5) “When I talk too much, the tone of my voice changes. It’s like my throat becomes tired.” (Participant 8).

Because physical activity requires muscular activity, after any extreme activity, most people complain of muscle fatigue. However, the participants described muscle fatigue that included changes in the tone of their body muscles by using phrases such as “insensibility”, “having a creep”, “the feeling of being benumbed” and “contusion of muscles”, as well as terms indicating a reduction of muscle strength and nerve and muscle dysfunction. These terms demonstrate the changes in muscle tone among chemically injured victims: “Most of the time at night, I feel severe pain in my legs and knees. I knock my legs on the ground and shake them in pain. On days when I have more activity than usual, I feel more pain in my muscles.” (Participant 9) “At night, I feel severe pain and exhaustion in my muscles, and due to this fatigue, I get restless.” (Participant 7).

Agitation caused by fatigue, shortness of breath occurring at night and fear of the onset of shortness of breath during sleep causes many disturbances in the sleep of chemically injured veterans. In a vicious cycle, sleep disorders cause physical fatigue the following day:

For several years, I have woken up several times at night. I feel severe weakness. When I want to move, I feel like I carry a heavy weight on my legs. (Participant 9)

My muscles ache. When I rub them, the pain decreases. By massaging and rubbing, the pain decreases up to 50%, and it helps a lot. (Does the pain only occur after activity?) No, I feel the pain as I’m sitting, or I even have pain in my sleep. Sometimes at night, I wake up from sleep due to the pain. (Participant 3)

Mental concerns

The participants not only described their experiences living with mental and emotional fatigue but also expressed the effect of their reactions to fatigue. In other words, a two-way reciprocal relationship between these factors and fatigue was described. Mental involvement has been called “intellectual preoccupation”, “mental fatigue” and “memory dysfunction”:

When you cannot do what you want to do, your thoughts become engaged with it. I can’t think anymore, and I cannot concentrate mentally. For example, when I talk too much, I get so tired that I can’t continue thinking and talking. So, my mind orders me to have a rest and be relaxed. When I argue with my kids, I feel I’m under a lot of mental pressure and stress. So I feel I’m tired mentally, and I think it can be an end for me. (Participant 1)

In other words, the participants described fatigue as the cause of emotional reactions, such as anger, irritability, fear, anxiety, impatience and feelings of aggression, in their daily lives:

When the soul has been damaged, the body would have been damaged too. The soul acts like the commander of body. I like to have a plan and also set goals in my life, but I cannot do that. And when I have no plan for my life, my problems get worse ... Anxiety becomes a severe problem and puts us under pressure. Shortness of breath starts without any reason. It usually occurs for

chemically injured veterans. Even when I'm a little anxious, shortness of breath and exhaustion become main problems. (Participant 1)

The data explication identified changes in their social and familial interactions and reductions in their ability to perform daily activities. However, these experiences appear to occur more often as a consequence of fatigue and under the influence of fatigue: "Most of the time, I have to stay at home. I like to study and farm, but I have to stay at home. I have no more power to do such work." (Participant 6) "I like to go to my friend's house or to the garden and have fun, but because of exhaustion, I can't." (Participant 3).

These changes also affect the participants' close family relationships and private lives. Their roles as husbands or fathers are influenced directly and indirectly by fatigue:

For example, our marital relationship or my relationship with my children is not as it should be. I'm not really in a good mood. The quality of my relationships have decreased so much that I'd rather to be alone. (Participant 9)

Discussion

This study show that fatigue is a chronic and progressive phenomenon that affects many daily activities of and has significant effects on chemically injured veterans. The chronic and progressive nature of fatigue results in periods of instability and exacerbation under the influence of certain factors. Although the purpose of this study, similar to all phenomenological studies, is not to generalize the findings, there are some commonalities with patient groups of other diseases. However, the chronic nature of this phenomenon among chemically injured veterans differs from chronic fatigue syndrome (Afari & Buchwald, 2003). Chemically injured veterans clearly describe the causes of fatigue and associate it with their levels of physical activity and changes in their fatigue tolerance threshold. The combination of chronic, prolonged fatigue and age produces a new type of fatigue that differs from short-term or acute fatigue in other patients (Swain, 2000).

Similar to patients suffering from chronic obstructive pulmonary disease (O'Donnell, Ora, Webb, Laveneziana, & Jensen, 2009), chemically injured veterans experience fatigue related to a shortness of breath. In some cases, muscle fatigue may also cause shortness of breath. In other words, the experience of fatigue may lead to dyspnea.

In describing the experiences of living with fatigue, the participants expressed other significant factors in addition to the effects of respiratory changes. These factors include emotional and psychological reactions, such as workplace stress, anxiety, anger, and a lack of respect from society for victims of chemical injury. The participants' interpretations of their experiences with mental fatigue contrasted with their experiences of physical fatigue. Mental fatigue is accompanied by changes in mood and memory. Other findings show that mental fatigue can decrease an individual's activity tolerance and accelerate the occurrence of physical fatigue due to changes in understanding rather than cardiac, respiratory and/or muscle changes (Marcora et al., 2009).

Muscle fatigue as a consequence of ongoing activity is found in all groups of people (McKenna & Hargreaves, 2008). However, the chemically injured veterans' descriptions of physical muscle fatigue differ from those of other people. Many symptoms, such as restlessness, insensibility, general weakness, restless legs and even changes in the power of the larynx, affect the physical integrity of the body. The experience of physical or mental fatigue can cause changes in the social and familial relationships of chemically injured veterans. A vicious cycle involving the inability to perform activities may increase the occurrence and intensity of the fatigue.

Limitations

One of the limitations of this study, which is a general limitation of qualitative phenomenological studies compared with quantitative studies, is the impossibility of generalizing the findings from the target community. The absence of female participants could also be considered a limitation.

Conclusion

The differences in the patients' experiences of living with fatigue due to different diseases demonstrate the importance of the phenomenology of this concept. Due to unique social interactions and pathogenicity, victims of mustard gas experience fatigue differently from patients with acute and chronic diseases. As a member of the medical team, nurses must have knowledge about the fatigue experiences of chemically injured veterans so that they can provide necessary recommendations and perform necessary actions in both advisory and health care roles. On the basis of the revealed themes, in practice, nursing care plans of fatigue in the mustard gas victims should include strategies that deal with the gradual reduction in physical ability and capability, respiratory dysfunction, sleep disturbances and also mental changes in this patient group. It is hoped that the themes revealed in this study generate additional understanding and insight for future innovative practice. Nurses with a phenomenological approach should be sensitive to the experiences of the chemically injured veterans living with fatigue and should authenticate these experiences to provide the appropriate care.

Conflict of interest

The authors declare no conflict of interest.

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