

Investigating the Relationship between Sleep Quality and Mental Health in Chemical Veterans in Comparison with Their Spouses and a Control Group

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ABSTRACT

Aim: This study was aimed to determine the relationship between sleep quality and mental health of veterans in comparison with that of their spouses and a control group. **Methods:** Thirty-seven chemical veterans with moderate to severe injury based on the standards of Foundation of Martyrs and Veterans Affairs were selected from Mazandaran province. Then, the spouses of 31 of them were selected and 15 of their close relatives also enrolled in the study as the control group. The three groups were evaluated by GHQ for their mental health and Pittsburg Sleep Quality Index (PSQI) for sleep quality. Collected data were analyzed using SPSS software 16 and descriptive and analytic statistical methods. **Results:** The mean score of mental health in veterans, their spouses and close relatives were 44.13 ± 14.4 , 34.19 ± 15.2 and 21.73 ± 17.32 , respectively. The mean scores of PSQI test in veterans, their spouses, and their close relatives were 10.94 ± 5.6 , 8.7 ± 5.5 and 4.27 ± 1 that the difference was statistically significant among the three groups ($P \leq 0.0001$). A positive relationship was seen between mental health and sleep quality in veterans and their spouses respectively ($r = 0.4$, $P = 0.02$) and ($r = 0.83$, $P < 0.0001$). **Conclusion:** Poor sleep quality in chemical veterans compared to their spouses and close relatives could be due to mental health, rather than chemical effects and chronic lung disease. Therefore, treatment of mental health might be an important step to improve the sleep quality of veterans.

KEYWORDS

Sleep Quality; Mental Health; Chemical Veterans

1. Introduction

Mental health is more than absence or lack of disease. The positive aspect of mental health, which is emphasized and defined by World Health Organization (WHO), is: "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity [1]." In other words, mental health is a state of welfare in which the individuals know their capabilities and can cope with the normal life stress. They can also be practical and productive in their occupation and

cooperate with others as a member of the society [2].

Since we spend one-third of our lives asleep and sleep cycle has a great impact on individual's life quality, people's quality of life and activities in the waking hours is largely influenced by their quality of sleep [3-5]. Sleep also affects the immune response of the body [6,7].

There is a complex relationship between the formation of psychiatric symptoms and the occurrence of various events in the life, especially the negative unpredictable threatening ones. Generally, these unwanted events bring about individuals' nervous breakdown and make them susceptible to show mental symptoms like sleep distur-

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bance which is one of the common complications of veterans [8].

One of the most common mental disorders resulting from war is called “post-traumatic stress disorder” [9]. Generally, there is no history of mental illness in these patients and the acute stress reaction recovers after a short period of time. The clinical features of post-traumatic stress disorder include: the painful re-experience of the event, attempt to avoid recalling the incident, flashbacks, difficulty in falling asleep and sleep continuity [10].

A considerable number of chemical veterans suffer from a range of physical and mental disorders which can potentially influence their sleep [11,12]. Research has shown that mental health of chemical veterans is threatened by the incident and the stress caused by the individuals’ physical conditions [13]. Despite the passage of so many years from the imposed war, one of the fundamental problems of veterans, especially chemical ones, is their post-war psychological problems and the damage to their mental health and social performance [1]. As mentioned, one of the psychological problems in these patients is sleep disorder; therefore, in this study we aimed to investigate the relationship between sleep quality and mental health in chemical veterans in comparison with that of their spouses and a control group.

2. Patients and Methods

The current study is a case-control research in which all the chemical veterans living in Mazandaran province with injury magnitude of moderate and severe, based on the standards of Foundation of Martyrs and Veterans Affairs, took part in this study. The study was approved by the ethics committees of research vice chancellor of Mazandaran University of Medical Sciences and informed consent was obtained from all participants after full explanation of the procedure. The participants were 37 chemical veterans (Group 1), spouses of 31 of them (Group 2) and 15 of their close relatives as the control group (Group 3). All three groups were examined for their mental health through GHQ and for their sleep quality using Pittsburgh Sleep Quality Index (PSQI). Data were analyzed using SPSS software.

PSQI questionnaire yielded a diagnostic sensitivity of 89.6% and specificity of 86.5% in distinguishing good and poor sleepers. This questionnaire assesses the quality of sleep of the patients during the last 4 weeks. PSQI has 7 components as follows: subjective sleep quality, sleep onset latency, sleep duration, sleep efficiency (the ratio of sleep time to the time spent in bed), sleep disturbances (individual’s waking up during the night), use of hypnotic medication, daytime dysfunction (the problems experienced by the patients during the day due to insomnia).

Each component score has a range of 0 to 3 points. A score of “0” represents normal state of sleep, “1” mild, “2” moderate, and finally, a score of “3” indicates severe sleep disorder. Then the scores of all seven components are added together and a global score ranging between 0 - 21 is obtained. A global score of 6 or more shows poor sleep quality [14,15].

Demographic information of the participants including age, gender, marital status, educational level, occupation and veterans’ magnitude of injuries was completed.

The General Health Questionnaire (GHQ-28) enjoys the sensitivity of 84% and specificity of 82% including questions of the lowest levels of common symptoms in different mental disorders. As a general classification, it can distinguish mental patients from those who consider themselves healthy. Thus, the major goal of the test is to distinguish between mental illness and state of being healthy. The questionnaire consists of 4 sub-scales of 7 questions including somatic symptoms, insomnia and anxiety, social dysfunction, and severe depression; the score for each question ranges from 0 to 3. The score limit in each scale is between 0 - 21 and the score of less than 7 is considered as mild disorder, 8 - 14 moderate disorder and finally a score of 15 - 21 is an indicator of severe disorder in each scale. The global score is between 0 - 84 and the total score of more than 23 shows poor general health of the person during the previous month [16]. Demographic information including age, occupation, educational level, injury magnitude, educational level of the spouse, all were collected in a questionnaire through the interview carried on by a psychiatrist. Data were analyzed using SPSS software.

3. Results

The mean age of veterans was 45 years old (SD of 8.2). Eleven participants were employees, 16 employing state, 4 were of military personnel and 3 were unemployed. The analysis of their educational level showed that one of them was illiterate, four were at primary school level, 5 at secondary school level, 21 had got diploma, and 6 had associate degree and higher. The magnitude of their injuries was as follow: 65% of them suffered 25% - 50% and 34.5% had 51% - 70% of injuries (**Table 1**).

The percentage of sleep quality disorder in three groups of veterans, their spouses and relatives were 86.1%, 63% and 37.5%, respectively, which showed a statistically significant difference among them ($P = 0.009$, $df = 2$) and the percentage of those suffering from mental health disorder in three groups of veterans, their spouses and relatives were 94.6%, 80.6% and 33.3% respectively, indicating statistically significant difference among the three groups ($P = 0.0001$, $df = 2$).

The mean scores of General Health Questionnaire

Table 1. Demographic information of Veterans, their spouses and close relatives.

Variables	Veterans	Veterans' Wives	Close Relatives
Age	45 ± 8.2	42 ± 7.7	22 ± 12.54
Gender			
Male	37	-	7
Female	-	31	8
Marital status			
Married	37	31	4
Single	-	-	11
Education Level			
Illiterate	1	4	-
Elementary school	4	6	2
Junior high school	5	9	5
High school	21	9	5
Higher education	6	2	3
Occupation			
Employee	11	2	-
employing state	16	-	-
Military personnel	4	-	-
Student	-	-	9
Housewife	-	28	3
Unemployed	6	-	3

(GHQ-28) in veterans, their spouses and close relatives were 44.13 ± 14.4 , 34.19 ± 15.2 and 21.73 ± 17.32 , respectively which showed a significant difference between the three groups ($P = 0.0001$) (Table 2).

The mean scores of Pittsburg Sleep Quality Index (PSQI) were 10.94 ± 5.6 , 8.7 ± 5.5 and 4.27 ± 1 in veterans, their spouses and close relatives (Table 3); the difference in three groups was statistically significant ($P \leq 0.001$).

There was a relationship between mental health and sleep quality of the veterans and their spouses, which were ($r = 0.4$, $P = 0.02$) and ($r = 0.83$, $P \pm 0.0001$), respectively. However, no significant relationship was observed in the mental health and sleep quality of their close relatives ($r = 0.01$, $P = 0.96$) (Table 4).

4. Discussion

Our study reveals that 86.1% of the chemical veterans suffer from poor sleep quality, while only 13.9% of them had good sleep quality, which is similar to the findings of Tavallaii *et al.* [17]. Poor sleep quality was observed in 63% of the veterans' spouses, which was also in correspondence with the findings of Tavallaii *et al.* for veterans' companions [18]; however, their study did not specify the relation of the companions with the veterans. Few studies have investigated the chemical veterans' sleep conditions and those who have worked on it have studied

the veterans' irregular sleep, sleep disorder, periodic changes in sleep, insomnia and nightmares [19-21]. Hence, we could not find a study with a similar design and these 3 groups.

In the current study 37.5% of veterans' close relatives had poor sleep quality, however, it has been reported 10% - 60% in different studies conducted on poor sleep quality with different age ranges (adolescents, normal population and adults) [18,22,23].

From mental health point of view, 94.6% of the veterans faced some problems; this was similar to the results of Vafaii *et al.* regarding depression in chemical veterans [24]. In their study, the intensity of depression was higher in chemical veterans than non-chemical ones and the prevalence was higher in this study compared to Zarghami *et al.*, which might be due to the time of investigation and type of the veterans [25]. In the present study, 80.6% of the veterans' spouses suffered from mental problems; therefore, the prevalence of psychiatric problems is higher than that of Saki and Ghanbari's [26]. A study conducted by Dezhkam comparing the mental health of the spouses of the veterans and those of the psychiatric patients showed that both suffered from mental health problems [27]. The results of the study carried on by Zarabi *et al.* showed that Iranian spouses with PTSD (Post-Traumatic Stress Disorder) suffered from mental health more than other women. In addition, they had more physical disorders, anxiety, insomnia and poor social performance [28]. The findings of this study indicated that 33% of veterans' close relatives had mental health problems; this finding is in line with the study worked on the prevalence of mental disorders in general population of Iran in different areas which showed that it varies from 9 to 36 percent, and 36.6% of the participants over 15 had emotional problems. This shows that our control group can be considered as the representative of the whole society [29].

On the other hand, the current study showed that there is a relationship between mental health and sleep quality of veterans and their spouses; however, such relationship was not found in their close relatives. It should be mentioned that different studies attribute the cause of poor sleep quality in the chemical veterans to different problems such as lung diseases following the chemical intoxication, which occurs in 50% of cases [10,11] PTSD symptoms reported in 90% of chemical veterans [30], anxiety disorder reported in 57%, depression symptoms reported in 57% - 92% of cases [20,31,32], and also to taking drugs such as Theophylline that prevents night bronchial contractions but leads to poor sleep quality [33].

According to the present study, the correlation between mental health and sleep quality in veterans and

Table 2. Comparison of test scores of GHQ in the three groups.

Scales	Groups	Veterans	Veterans' spouses	Close relatives	P value
		Mean ± SD	Mean ± SD	Mean ± SD	
Physical symptoms		4.83 ± 13.48	4.88 ± 9.64	5.56 ± 5.53	0.000 F = 14
Anxiety and insomnia		4.53 ± 13.08	5.88 ± 10.45	6.39 ± 6.86	0.001 F = 7
Performance failure		4.37 ± 11.43	4.62 ± 9.32	4.69 ± 7.06	0.007 F = 7
Depression symptoms		5.07 ± 6.83	4.63 ± 4.80	4.28 ± 2.60	0.015 F = 4.4
GHQ global score		44.13 ± 14.4	34.19 ± 15.2	21.73 ± 17.32	0.0000 f = 12

Table 3. Comparison of scores of Pittsburg Sleep Quality Index (PSQI) in the three groups.

Scales	Groups	Veterans	Veteran's spouses	Close relatives
		Mean ± SD	Mean ± SD	Mean ± SD
Subjective sleep quality		0.92 ± 2.09	1.15 ± 1.4	0.99 ± 0.87
sleep onset latency		0.99 ± 2.06	1/31 ± 1/84	1.03 ± 0.66
sleep duration		0.92 ± 2.41	1/36 ± 1/88	1.21 ± 0.66
Sleep efficiency		1.38 ± 1.50	1/27 ± 1	1.21 ± 0.66
sleep disturbances		1.12 ± 2.34	1/60 ± 2/23	1.38 ± 1.71
sleeping medication		1.27 ± 1.72	1/26 ± 0/95	1.18 ± 0.62
daytime dysfunction		0.96 ± 1.4	0/95 ± 1/21	1.18 ± 0.62
PSQI global score		10.94 ± 5.6	8.7 ± 5.5	4.27 ± 1

Table 4. Comparison of results of GHQ and PSQI in the three groups.

Groups	Questionnaires		R	P-value
	GHO scores	PSQI scores		
Veterans	44.13 ± 14.4	10.94 ± 5.6	0.4	0.02
Veterans' spouses	34.19 ± 15.2	8.7 ± 5.5	0.83	0.0001
Close relatives	21.73 ± 17.32	4.27 ± 1	0.01	0.96

their spouses was positive and strong, although their spouses did not have any history of lung diseases. Thus, it seems that the major predictor of sleep quality is mental health, including PTSD, other anxiety disorders and depression. It can be concluded that by appropriate treatment of the psychiatric disorders in veterans, sleep quality will likely improve.

It is recommended that other researchers design nationwide studies and simultaneously investigate the pulmonary problems and match the veteran groups in order to confirm and generalize the investigated hypothesis of this study.

Competing Interests

None declared.

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