Psychometric Testing of the Arabic version of the Pittsburgh Sleep Quality Index (A-PSQI) among Coronary Artery Disease Patients in Jordan

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Abstract

The purpose of this study was to test the Arabic version of the Pittsburgh Sleep Quality Index (PSQI) among cardiac patients in Jordan. The data was collected from 130 Arabic cardiac patients during their routine visit to the cardiology clinic using the Arabic versions of the Pittsburgh Sleep Quality Index, the Insomnia Severity Index and the Medical Outcome Study Short Form 36. The mean Pittsburgh Sleep Quality Index score was 9.14 (SD = 2.34). Internal consistency reliability was 0.74. The correlations between the global Pittsburgh Sleep Quality Index score and the components ranged from .25 to .49. Also, PSQI showed a moderate correlation with the Insomnia Severity Index scores (r= .36, p <.001), and a small negative correlation with Medical Outcome Study Short Form 36 pain subscale (r= -.19, p= .032).   Psychometric estimates show that the Pittsburgh Sleep Quality Index is reliable and valid for measuring sleep disturbances among Arabic clinical population.

Keywords: Reliability, validity, cardiac, sleep

1. Introduction

Sleep research in Jordan is very limited in both healthy and clinical populations such as patient with coronary artery disease (CAD). This is due to the lack of instruments measuring sleep in the Arabic language. Recently, the Pittsburgh Sleep Quality Index (PSQI) [1] was translated into Arabic and tested in a healthy Arabic population. [2] The newly translated version demonstrated acceptable reliability and validity psychometric properties in this healthy sample. [2] However, there is a need to test the PSQI and obtain psychometric values among clinical Arabic populations living in their native country. This will provide an opportunity to have a valid and reliable instrument in Arabic language to conduct descriptive and intervention studies among Arabic clinical populations.

In Western countries, the PSQI was found to be a reliable and valid tool to measure sleep quality disturbances among healthy [3] and clinical populations such as patients with CAD. [4] This, however, has not been done among Arabic populations, especially among patients with chronic health conditions. This study aimed to validate the PSQI among CAD in Jordan.

It is common for patients with CAD to have sleep disturbances. [5-7] The major sleep disturbances reported by CAD patients include difficulty falling asleep, [5, 6, 8] difficulty in maintaining sleep, [6, 8] early awakening in the morning, [5] increased daytime sleepiness [6, 8] and difficulty in being refreshed by sleep. [5, 8] Studies on CAD patients also reported significant relationships between sleep quality and daytime sleepiness, physical and mental tiredness and other physical symptoms such feeling of general weakness and muscle ache. [5, 6, 8] Johansson et al [7] examined 204 patients (men= 144, women= 66) four months post Myocardial infarction (MI). They found that 21% of the patients reported difficulty initiating sleep, and repeated nocturnal awakening that were associated with difficulty returning to sleep, and 18% had troubled sleep. They also found strong correlation of sleep disturbances (as measured by Karolinska Sleep Questionnaire) with fatigue (r= .47, p=.01), anxiety (r= .40, p=.01) and depression (r= .64, p=.01). Similarly, Lopez et al [9] reported poor physical and social health status among CAD patients as measured by the Sickness Impact Profile.

Sleep quality disturbances are common among healthy Arabic populations living in foreign countries. [2, 10] Sleep quality was examined using the German version of PSQI among Arabic Moroccan women (n= 64) residing in Germany. [10] The researchers used a PSQI global cut-off score of >6 to indicate poor sleepers as reported by Backhaus et al. [11] The results showed that nearly half of the sample were poor sleepers. Subjective sleep quality needs to be assessed by a self-report measure written in the native language of the participants. Thus, this further supports the need to test the PSQI and obtain psychometric values of it in an Arabic population living in their native countries.

Similarly, Suleiman et al. [2] reported that 60% (n= 35) of a healthy Arabic sample, residing in the United States, reported a global PSQI score more than 5, the cut-off to indicate poor sleepers. The researcher reported a border line internal consistency reliability of .65 for the total PSQI scores. [2] The previous Arabic studies that

measured sleep quality were conducted using samples who resided in foreign countries. Both researchers [2, 10] suggested that the higher scores of the global PSQI might be related to the process of societal integration which had a negative effect on sleep quality. Thus, the Arabic version of PSQI should be tested in Arabic populations residing in their home country. Therefore, the purpose of this study was to test the psychometric properties of the Arabic version of the PSQI in a sample of CAD Arabic patients who reside in Jordan.

2. Materials and Methods

2.1. Design. This is a descriptive cross-sectional study.

2.2. Sample. Arabic men and women at least 18 years old, who read and write in Arabic and diagnosed with cardiac event were recruited. Cardiac event was defined as a diagnosis of myocardial infarction or angina pectoris or underwent cardiac procedure such as cardiac catheterization, percutaneous transluminal coronary angioplasty with or without the insertion of stent, or cardiac surgery.

2.3. Measures. In addition to A-PSQI, two other measures had been translated into Arabic were administered for validity comparisons in this study. These measures are the Insomnia Severity Index (ISI) [2], the Medical Outcome Study Short Form 36 (MOS SF-36) [13]. A demographic questionnaire was used to describe the characteristics of the study sample.

2.3.1. The PSQI is a reliable and valid tool that measures sleep quality and quantity over a one month period. [1] It consists of 19 self-rated questions that subsumed within seven component scores or subscales: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. A global score can be obtained from the summation of the seven components that ranges from 0 to 21 with higher scores denoting poorer sleep quality. The original authors set up a cut-off of > 5 for the global score to distinguish poor sleepers (> 5) from good sleepers (< 5). [1]

2.3.2. The ISI is a reliable[14] and valid[15, 16] tool that measure the severity of insomnia for the previous two weeks using seven items. Each item ranges from 0 (Not at all severe) to 4 (Very severe) with total score range from 0 to 28. The higher scores denote greater insomnia severity.

2.3.3. The Medical Outcomes Study Short Form-36 (MOS SF-36) [17, 18] is a reliable[19] and valid [20, 21] generic tool that is not specific to age, disease or treatment. It has eight subscales; general health, mental health, physical, mental and social functioning, role physical, role emotional, and bodily pain. The subscales' score ranges from 0 to 100 with higher scores indicating higher functioning.

2.4. Procedures. Approval to conduct the study was obtained from the institution where the study was conducted. At the cardiology clinic, the participants were screened by the researchers for the eligibility criteria and invited to participate in the study. Participants' return of the questionnaires constituted consent. Further, the investigator reassured the participants that they have the right to withdraw from the study at anytime and all information were kept confidential.

3. Results

A total of 150 questionnaires were distributed to cardiac patients. Of these 150 questionnaires, 130 were returned with a response rate of 86%. Patient's average age was 46.70 (SD = 14.73). The majority of participants were male (n= 70, 50.7%), married (n = 43, 33.1%), work either full or part- time (n=73, 56%), and had post secondary education (n= 52, 38%)

In this study, cardiac patients reported an average global PSQI scores of 9.14 (SD = 2.34). Almost all the patients were poor sleepers with global PSQI scores > 5 except one patient only scored 4 (Table 1). The patients slept on average 8.31(SD= 2.40), rated their subjective sleep quality as fairly bad, needed on average 15.16 (SD= 11.16) minutes to fall asleep with minimum of 3 and maximum of 60 minutes, and 70% of the sample scored less than 60% sleep efficiency. They reported moderate alteration in daytime dysfunction and sleep disturbances and scored low for the use of sleep medication. The Cronbach's Alpha for the PSQI in the current study was .74. Further, item to total PSQI correlations ranged from .25 to .49 (Table 2). Item to item correlations ranged from -.24 to .33. The global PSQI scores showed a moderate correlation with the ISI scores (r= .36, p <.001), and a small negative correlation with MOS SF-36 pain subscale (r= -.19, p= .032).

4. Discussion

The current study revealed high prevalence of sleep disturbances among cardiac patients in Jordan. Almost all the patients reported global score higher than the cut-off score of 5.   To the best of the investigators' knowledge, this is the first study that examined sleep disturbances among cardiac patients of Arabic origin using A-PSQI. The prevalence of sleep disturbances in the current study was higher than other studies that examined sleep among

healthy Arabic populations. [2, 10] The current study examined sleep among cardiac patients, while in other studies the participants were healthy. The reported sleep disturbance in Suleiman et al. [2] and Voss and Tuin [10] was related mainly to living in foreign countries where they used the majority of their time either to meet their work or career responsibilities [2] or engage in societal integration process. [10] Additionally, Voss and Tuin [10] used global PSQI score > 6 as a cut-off score to determine poor sleepers, contrary to the current study were researchers used cut-off score of >5 that was recommended by the PSQI original authors. Further, the sample size in the current study was bigger than previous Arabic studies which recruited sample size ranged from 35 [2] to 64. [10] This difference in sample size between the current study and other Arabic studies might be responsible for the difference in the prevalence of sleep disturbances.

The majority of cardiac patients in the current study were poor sleepers. Similar results were reported among cardiac patients from other countries. [5, 6-9] Participants in this study had the same disease process and treatment as other cardiac patients in other countries around the world. Consequently, CAD patients in Jordan and other countries might experience comparable sleep disturbances.

The global PSQI was higher here than other studies that used PSQI among CAD patients. [4, 22, 23] This, however, might be explained by the nature of the sample. In this study surgical and medical cardiac patients were recruited, while Hedges and Redeker [4] recruited patients who underwent coronary artery bypass graft surgery only. Redeker et al. [23] reported that sleep among cardiac patients who underwent cardiac surgery improved by time. This is different than medical cardiac patient who had different treatment modalities.

The results of this study revealed evidence for acceptable internal consistency reliability among this sample of cardiac patients. Similar results were reported among cardiac patients who underwent cardiac surgery. Researchers reported reliability that ranged from .66 [22] to .79. [23] In the current study, patients reported sleep disturbances regardless of their treatment regimen. This may explain the similarity of PSQI internal consistency with studies that examined cardiac patients who underwent surgery. The global PSQI scores had moderate positive correlation with the ISI scores and a small negative correlation with MOSSF-36 pain subscale. Similarly, previous studies reported positive correlation between ISI scores and global PSQI scores. [2, 15] It can be concluded that regardless of the type of clinical population, both instruments PSQI and ISI measure the same construct. Both instruments examine many sleep quality components such as latency, night wakening, etc). No studies were found reporting the correlation between pain subscale for the MOS SF 36 and the global PSQI scores. However, small negative correlation was reported between vitality subscale and the global PSQI scores in previous studies. [21] These results might be explained by the nature of the sample. Carpenter and Andrykowski [21] examined patients with cancer. Cancer patients have reported fatigue as the most distressing symptom, [24] but cardiac patients encounter pain as the most distressing symptom [25] that disturbs sleep. Further studies are needed to reveal the relationship of symptoms such as pain and fatigue with sleep among cardiac patients.

5. Conclusion

Finding from this study supported that the Arabic version of PSQI is a reliable, valid and easy to use clinically to measure sleep among Jordanian cardiac patients. The use of A-PSQI as a reliable and valid tool can give more insight about sleep disturbances in clinical settings, and thus has great potential to improve the management of sleep disturbances. Future studies are needed to identify the proper interventions to decrease sleep disturbances and promote patients quality of life.

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Table 1
PSQI Global and Components Means and Standard Deviations

PSQI component	Total possible scores	Mean	Standard deviation	Range in sample
Component 1 (Subjective sleep quality)	0-3	1.64	1.00	0- 3
Component 2 (sleep latency)	0-3	.75	.71	0- 3
Component 3 (sleep duration)	0-3	.51	.81	0- 3
Component 4 (sleep efficiency)	0-3	.48	.82	0-3
Component 5 (sleep disturbances)	0-3	2.39	1.31	0-3
Component 6 (sleep medication)	0-3	.73	.88	0-3
Component 7(Daytime dysfunction)	0-3	1.64	.75	0-3
Global PSQI	0-21	9.14	2.34	4-18

Note: Component 1 is denoted by C1, and so forth for all components. PSQI = Pittsburgh Sleep Quality Index.

Table 2.
Component-to-Component Correlations for the Arabic Version of the PSQI

PSQI component	C1	C2	C3	C4	C5	C6	C7	Global score
Sleep quality (C1)	-	.07	.04	.24**	028*	-.033	.034	.33**
Sleep latency (C2)			.25**	.09	.23*	.26**	.068	.47**
Sleep duration (C3)				.29**	.10	-.121	-.14	.34**
Sleep efficiency (C4)					-.03	.094	-.016	.42**
Sleep disturbances (C5)						.086	.15	.49**
Use of sleep medication (C6)							.33**	.38**
Day time dysfunction (C7)							-	.25**

Note: PSQI = Pittsburgh Sleep Quality Index.
*$p = .05$, ** $p= .01$

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