

## Sleep Disturbances among Alzaytoonah University Students in Jordan

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### Abstract

The College students are at high risk for sleep disturbances that may affect their daily health and functioning. Therefore, the purpose of this study was to examine sleep disturbances among 119 Arabic nursing students in Jordan. The average global Pittsburgh Sleep Quality Index (PSQI) score was 8.01 (SD= 3.15; range= 1.3 to 14). Furthermore, significant differences were found between good and poor sleepers in terms of employment, mental functioning, social functioning, and bodily pain but not in terms of gender, age or grade point average. This cross-sectional study provides preliminary evidence that nursing students in Jordan had poor sleep quality and it may serve as basic information for Arab researchers to conduct intervention studies in the future.

**Keywords:** sleep, nursing, students, employment, functioning

### 1. Introduction

College students are a high risk group for sleep disturbances (Lund, et al., 2010; Suen, et al., 2010; Sweileh et al., 2011; Taylor, et al., 2011; Taylor & Bramoweth, 2010). It was reported that up to 65% of a general college student population complained of sleep disturbances (Lund, et al.). Further, sleep disturbances were found to affect students' daily activities (Carney, et al., 2006; Lund et al.) and increase their daytime sleepiness (Tsui & Wing, 2009). Sleep disturbances that were frequently reported among college students include less sleep time (Lund et al.; Tsui & Wing, 2009), greater time to fall asleep (Asaoka, et al., 2010; Lund et al.), use of sleeping medication, and excessive daytime dysfunction (Lund et al.).

Sleep disturbances among college students in Jordan have received minimal research attention. It is important to examine the sleep behaviors of students as their sleep hygiene may not be a priority and their poorer sleep hygiene may increase the prevalence of sleep disturbances among students. In countries such as the U.S., the National Sleep Foundation conducts an annual survey of American's sleep habits. It also takes steps to ensure that Americans are aware that their sleep is an important component of their health and safety and those they recognize the signs and symptoms of sleep disorders and seek effective treatment for them (<http://www.sleepfoundation.org/healthcare-professionals>). There is no similar foundation in Jordan that deals with sleep issues. Thus, this study will provide Jordanian researchers with information regarding sleep behavior in Jordan utilizing nursing students as the population of interest.

Three studies were found that examined sleep among Arabic students (Margolis & Reed, 2004; Suleiman, et al., 2010; Sweileh et al., 2011). Margolis and Reed examined sleep among medical students in the United Arab Emirates during the holy month of Ramadan. During this month, Muslims are not allowed to drink or eat during the daytime. Fasting and prayers during the day were found to interfere with nighttime sleep quality (Margolis & Reed, 2004). In addition, they found that students had longer sleep hours during the nights before and after Ramadan ( $F [2,366] = 15.289, p < 0.001$ ). They also found that daytime sleep was significantly shorter before ( $z = 2.654, p = 0.08$ ) and after Ramadan ( $z = -4.94, p < 0.001$ ). The timing of this study (during Ramadan) may have been the main factor contributing to sleep disturbances.

In a second study, Sweileh et al. (2011) examined sleep behavior at a time other than Ramadan among medical (n=203) and non-medical (n=197) students in Palestine. Although about half of the students reported good sleep quality, the students reported average sleep duration of  $6.4 \pm 1.1$  hours per night. Almost 18% (n=72) woke up before 6 am, while 41.7% (n= 167) went to bed after midnight. Additionally, 50% (n= 201) of the students reported nocturnal awakenings two times per night. Restless leg syndrome, at least one night a week, was reported by 8.5% (n= 34) of the students. Students also reported sleep problems such as feeling tired in the morning (n=220; 55%), and 71% (n=285) had daytime sleepiness at least once a week. Further, 35.2% (n=141) had sleep latency of 10-30 minutes and only 1% (n=4) used sleep medication.

The third study examined sleep behavior in an Arab population living in the U.S. of which 37% (n= 35) of the sample was students (Suleiman et al., 2010). They used the Pittsburgh Sleep Quality Index (PSQI; Buysse, et al., 1989) for sleep quality measurements. Researchers found that 60% (n= 35) were poor sleepers with an average global PSQI score in all participants of 5.17 (SD=2.66). Buysse et al. established a cutoff score of 5 to

distinguish between good sleepers (<5) and poor sleepers ( $\geq 5$ ). The participants reported average sleep duration of 7.3 hrs (SD= 1.1) per night, and 16 to 30 minutes sleep latency. Further, participants reported sleep efficiency of >85%. The researchers suggested that the participants were intentionally staying awake to accomplish their educational or work-related goals (Suleiman et al.). Although the Arabic participants recruited in Suleiman et al.'s study were recruited directly from the community, they were living in a foreign country which may have interfered with their sleep quality and made their sleep behavior worse. Because so few studies were found in Arab populations, more studies are needed that examine sleep behavior in this population.

In non-Arabic countries, most of the studies examined sleep disturbances either among the general university population of students (Lund et al., 2010; Mesquita & Reimão, 2010; Suen et al., 2010), or in specific student majors such as business (Preisegolaviciute, et al., 2010; Tsui & Wing, 2009), medicine, and law (Preisegolaviciute et al.). These authors found that the majority of college students were poor sleepers. In a general university population in Hong Kong, Suen et al. found that about half of their sample reported poor sleep quality (scored > 5) as measured by PSQI (Buysse et al., 1989). Similarly, Lund et al. found that 60% (n= 1125) of the general student population including sophomores, junior and seniors in a large private university in the Midwest (in the U.S.) were poor sleepers.

On the other hand, among specific students' majors, Preisegolaviciute et al. (2010) found that medical students (n= 138) reported the highest PSQI global scores 6.56 in comparison with law students (6.26, n=116) and business students (5.56, n=133). Also, medical students reported worse sleep efficiency, greater use of sleeping medications, and more daytime dysfunction on the PSQI than law and business students (Preisegolaviciute et al.). The researchers suggested that medical students were poor sleepers because they spend more time studying, were more anxious about their studies, were less satisfied with their results, and were more often studying before going to sleep. In contrast, Aloba, et al (2007) reported a PSQI mean score of 4.43 (SD = 2.67) among 520 Nigerian general university students. Aloba et al. also found low specificity for the PSQI measure (0.545) which indicated that many cases of poor sleepers were missed. They validated the PSQI against the Diagnostic and Statistical Manual of Mental Disorders-IV diagnosis of insomnia criteria and found the PSQI to be of moderate use in predicting insomnia (Aloba et al.). However, the low specificity and lower scores may reflect cultural differences in sleep behaviors. Thus, these contradictory results warrant further studies to examine sleep disturbances among college students.

It is likely that poor sleep quality is related to lower levels of health and functioning among college students; however, few studies were found examining these relationships. One study was found that examined functioning of college students (Pekmezovic, et al., 2011). Pekmezovic et al. used the Medical Outcome Study Short Form 36 scale (SF-36; Ware, et al., 2000; Ware, et al., 1993) to examine functioning among 1,624 students (53.7% females) from different university majors. They found that the highest scores of the SF- 36 scales were obtained for the physical functioning subscale (M = 93.7, SD=12.5) and the lowest SF- 36 scores were obtained for the vitality subscale (M = 64.7, SD=21.1). Additionally, they found that medical students scored significantly worse than students in other disciplines (i.e., social sciences, humanities, technology and engineering students) in vitality (p= .001), mental health (p= .014), and role emotional (p = .030). These results suggest that students in health care majors may experience lower levels of functioning than students from other majors. More studies are needed, however, comparing students with and without sleep disturbances in their physical and psychosocial functioning.

Other demographic (gender, employment) and academic (enrollment in clinical courses, grade point average [GPA]) factors have been shown to be related to sleep disturbances; however, the findings have not been consistent. In relation to gender, several investigators found that women were poorer sleepers than men (Aloba et al., 2007; Preisegolaviciute et al., 2010). Similarly, in comparison with men, woman had significantly more wake time after sleep onset (WASO) (7.54 min vs. 5.27 min,  $p < .05$ ) (Taylor & Bramoweth, 2010) and longer sleep duration ( $t = -2.69$ ,  $p < .01$ ) (Tsui and Wing, 2009). Further, males had significantly later bedtimes and rise times than females (Lund et al., 2010; Taylor & Bramoweth, 2010). In contrast, Suen et al. (2010) reported no significant gender differences in general sleep disturbances.

Employment, academic achievement, and early morning clinical rotations are also important factors that may be associated with sleep disturbances among students. Tsui and Wing (2009) studied 620 business students who were 70% female with mean age of  $19.9 \pm 1.2$  years. They found that students with a part time job reported greater day time sleepiness than those without a part time job (37.9% versus 29.3%;  $\chi^2 = 4.8$ ,  $p < .05$ ). Sweileh et al. (2011) studied the relationship between sleep disturbances and academic achievement among 400 medical students. They measured academic achievement on a four point scale: excellent, good, satisfactory, and poor. They reported that students with a higher frequency of nightmares had lower academic achievement ( $r = .40$ ,  $p = .02$ ). On the other hand, there were no significant correlations between academic achievement and parasomnia or other sleep problems (Sweileh et al). Finally, early morning clinical rotations may contribute to sleep disturbances particularly among nursing students. Previous studies reported that business students who attended

early classes between 8 and 11 am in the morning had shorter sleep duration ( $t= 3.56, p<.001$ ) than those who had no early classes (Tsui & Wing, 2009). Further, Asaoka et al. (2010) reported a negative association between attending early classes and bed time delay ( $\beta= -.30, p<.01$ ) among a general university student population in Japan. Few studies were found either in Arab or non Arab countries that examined the associations among these sociodemographic variables and sleep disturbances among university nursing students. Therefore, the purpose of this study was to examine sleep quality and to compare the differences between good sleepers and poor sleepers in physical and psychosocial functioning and selected demographic characteristics in undergraduate nursing students in Jordan.

## 2. Materials and Methods

2.1. Design. This is a descriptive comparative study to describe sleep disturbances among nursing college students in Jordan and to compare the differences between good sleepers and poor sleepers in physical and psychosocial functioning and in sociodemographic characteristics.

2.2. Sample. The participants were full-time undergraduate Jordanian nursing students at a large private university in Amman, Jordan. A power analysis was done using G\*Power 3.0.10 (Faul, et al., 2007) for the comparison of differences between good and poor sleepers in physical and psychosocial functioning. In order to detect a significant differences between the two groups, assuming a small-medium effect size (Cohen's  $d = 0.30$ ),  $\alpha = 0.05$ , power = 0.80, and using a two-tailed t-test, a sample of 82 subjects was needed (Cohen, 1988). The inclusion criteria were: men and women at least 18 years old, able to read and write in Arabic, and a current student in the bachelors program at the college of nursing. Students who had respiratory problems such as sleep apnea were excluded from the study.

2.3. Measures. All participants completed the demographic questionnaire which included questions about age, employment status, academic achievement (measured by grade point average [GPA]), marital status, monthly income, and whether or not the students were enrolled in clinical coursework.

2.3.1. Sleep was measured by the Arabic version of the PSQI (Suleiman et al., 2010). The PSQI is a reliable and valid tool to measure sleep quality and quantity over a one month period (Buysse et al., 1989). It consists of 19 self-rated questions. The items yield seven component scores or subscales: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. Component scores can range from 0 to 3 with higher scores indicating poorer sleep. In addition, 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 score of  $\geq 5$  for the global score to distinguish poor sleepers ( $\geq 5$ ) from good sleepers ( $< 5$ ) (Buysse et al., 1989). Buysse et al. reported high internal consistency reliability for the global PSQI ( $\alpha = 0.83$ ) among 148 patients with different psychiatric problems. The validity of the PSQI was supported by significant differences on the global PSQI between control subjects (healthy subjects) and all psychiatric patient groups (Buysse et al., 1989). Further, the cut-off score of  $\geq 5$  on PSQI produced 89.6% sensitivity in detecting poor sleepers and 86.5% specificity in detecting good sleepers of patients compared to control group. The PSQI was used widely to measure sleep quality among college students (Aloba et al., 2007; Carney et al., 2006; Lund et al., 2010; Mesquita & Reimão, 2010; Preisegolaviciute et al., 2010; Suen et al., 2010; Tsui & Wing, 2009). In this study, the internal consistency reliability of the tool was .66.

2.3.2. Functioning was measured by the Arabic version of the SF- 36 (Sabbah, et al., 2003). The SF-36 is a widely used multidimensional scale used to assess health and functioning (Ware et al., 2000; Ware et al., 1993). This generic tool is universally valued and is not age, disease, or treatment specific. The SF-36 measures eight health concepts: Physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional and mental health. The subscale scores range from 0 to 100, with higher scores denoting better functioning. The internal consistency reliabilities ranged from .85 for general health to .94 for physical functioning among 2,737 of the U.S. population (Kazis et al., 2004). In an Arab general population ( $n= 1632$ ), the internal consistency reliabilities of the subscales ranged from .70 to .90 (Sabbah et al., 2003). In this study, the internal consistency reliabilities of the subscales ranged from .42 (General Health) - .88 (Physical Function) with an average internal consistency of .71.

2.3.3. The sociodemographic variables were measured as follows: age measured by years, gender (male/female), employed (full time or part time vs. not working), and enrolled in clinical coursework (yes/no). The GPA followed a scale of 0 to 100 score with  $<60$  considered poor while 100 is a perfect score. The 0 to 100 score that is calculated cumulatively from all of their courses was the score used in the data analysis.

2.4. Procedures. Approval to conduct the study was obtained from the university IRB where the study was conducted. Participants were recruited through direct contact with the investigators at the university campus at the beginning of the semester prior to exams and end-of-semester work load. The participants were screened for the inclusion and exclusion criteria and were invited to participate in the study. The study purpose, objectives, risks, and benefits were explained for potential participants. They were informed that their return of the

questionnaires constituted consent. Further, the investigators reassured the participants that they had the right to withdraw from the study at anytime. Additionally, all information regarding the participants including their names was kept confidential in a locked file. The questionnaires were given to the students by the investigators at the beginning of the class and required about 10 minutes for the students to complete. The data was not collected in Ramadan or any other Muslim's religious occasion.

2.5. Data analysis. The Statistical Package for Social Sciences (SPSS) version 18 was used for data analysis. All data were double checked for accuracy. Frequency distributions were examined to check for outliers and normality of distributions. Means and standard deviations for continuous variables and numbers and percentages for categorical variables were computed. The t-test was used to compare differences between groups for continuous variables. Chi-square was used to examine differences for categorical and ordinal variables.

### 3. Results

3.1. Sample. A total of 150 current students were given questionnaire packets through direct contact with the investigators. Of these 150 students, 118 returned the questionnaires and were eligible to participate in the study indicating a response rate of 79%.

3.2 Sleep quality scores. Students reported an average sleep duration of 6.48 hours (SD= 1.9; range= 3 to 12 hours) (see Table 1). In this study the average global PSQI score was 8.01(SD= 3.15; range= 1.3 to 14). In classifying good vs. poor sleepers, 17 participants (14%) reported global PSQI scores of <5 and 101 participants (85%) reported global PSQI scores of  $\geq 5$  with lower scores on the global scale and all of the PSQI components indicating better sleep. Although 65% of students reported good sleep efficiency (M= 0.48, SD=0 .82), students rated their subjective sleep quality as fairly poor (M= 1.32, SD= 0.91). Students needed, on average, 25.12 minutes (SD= 17.13) to fall asleep with 48% of the students reporting an inability to fall asleep within 30 minutes. Students reported few problems with daytime functioning (M= .71, SD= .70); however, in contrast, they reported moderate sleep disturbances (M= 1.33, SD= 0.60). In addition, subjects indicated moderate use of sleep medications (M= 1.23, SD= 0.94).

3.3. Sleep scores differences between groups in terms of sociodemographic variables. The students were then divided into good sleepers (global PSQI score < 5) vs. poor sleepers (global PSQI score  $\geq 5$ ) to compare differences in their sociodemographic characteristics and physical and psychosocial functioning between the two groups. Students' ages in both groups ranged from 19 to 40 years of age (see Table 2). The majority of the students were single (n=100; 84%), employed (n=64; 54%), and were enrolled in clinical course work (n=90; 76%). The students were about half male and half female. The students primarily worked as nursing assistants for either an 8 or 12 hour shift for a total of 40 hours per week. Significant differences were found between good and poor sleepers and employment status. If students were working, they were found to be significantly poorer sleepers (see Table 2). No significant differences were found between good and poor sleepers in relation to gender, or whether they attended clinical courses. There were no significant differences between good and poor sleepers in terms of GPA ( $t= .863$ (df = 117),  $p= .49$ ). Good sleepers had an average of 73.82 ( $\pm 6.2$ ), while poor sleepers had an average 72.13 ( $\pm 7.7$ ) (see table 2).

3.4. Sleep scores differences between groups in terms of sociodemographic variables in terms of functioning. The mean scores comparing differences between good and poor sleepers in the SF-36 subscales are presented in table 3. For all of the SF-36 subscales, the good sleepers' scores were higher than the poor sleepers' scores; however, only three subscales were significantly different between the groups. Good sleepers scored significantly higher than poor sleepers in mental functioning, social functioning, and bodily pain (less interference in functioning due to pain).

### 4. Discussion

The results of the study revealed a high prevalence of sleep disturbances among college students enrolled in a nursing program in an Arabic country. The majority of the students in this study scored above the cut-off score of 5. This is the first study to examine sleep disturbances among Arab college students using the Arabic version of the PSQI. No studies were found that used the PSQI to measure sleep among Arab students; however, two studies were found that examined sleep behavior using tools other than PSQI. Comparisons with one of these prior studies is difficult for two reasons: a) the researchers used a different instrument (the Epworth Sleepiness Scale) to measure sleep; and b) although the medical students reported high levels of daytime sleepiness, their sleep behavior was measured during a time (holy month of Ramadan) in (Margolis & Reed, 2004) when it is known that fasting and prayers interfere with nighttime sleep quality. The results in the second study Sweileh et al. (2011) were consistent with the Margolis and Reed study. Sweileh et al. designed their own tool to measure sleep behavior. The students were asked to limit their responses to incidents that occurred during the past week. The tool included several different types of questions about sleep habits and sleep problems such as difficulty falling asleep and failure to maintain sleep. The sleep difficulties reported by the students were that 42% of the

students went to bed after midnight, 36.3% had sleep latency more than 30 minutes, and more than half of the sample had a day time nap at least once per week (Sweileh et al.).

Similar to the current study, other researchers, using non Arabic samples, also examined sleep early in the academic semester preceding exams or finals (Lund et al., 2010; Tsui & Wing, 2009; Suen et al., 2010) and found that the percentage of students who reported PSQI scores  $\geq 5$  ranged from 38% among American students (Lund et al.) to 58% among Chinese students (Tsui & Wing). Additionally, 32% (Lund et al.) of the students reported an inability to fall asleep within 30 minutes compared to 48% in the current study. Additionally, in a large study that included 16,483 university students from 24 countries in Europe, South Asia, North America and South America, the average sleep ranged from 6 to 8 hours, the Asian countries reported the shortest average sleep duration of  $< 7$  hours. All other countries reported an average sleep duration  $\geq 7$  except Romania and Spain that reported an average sleep  $\geq 8$  hours (Steptoe, et al., 2006).

The percentage of poor sleepers in this study was higher than in other studies. For example, Aloba et al. (2007) reported fairly low global PSQI scores ( $M = 4.34$ ,  $SD = 2.67$ ) among a sample of graduate and undergraduate university students among non-Arab students in Nigeria. Aloba et al. found low specificity for the PSQI measure (0.545) which indicated that many cases of poor sleepers were missed. They found the PSQI to be of moderate use in predicting insomnia as they validated it against the Diagnostic and Statistical Manual of Mental Disorders-IV diagnosis of insomnia criteria. Further, they went on to explain that the PSQI was not intended for the assessment of insomnia alone but rather as an indicator for various sleep disturbances.

On the other hand, other researchers have challenged the application of the same cut-off score for all populations (Backhaus, et al., 2002; Carpenter & Andrykowski, 1998; Tsai, et al., 2005). In this study, the cut-off score for the global PSQI  $\geq 5$  (to indicate poor sleepers) may be too low as an indicator of poor sleep in Arabic students. Further studies are needed to establish a cut-off score that can detect good from poor sleepers in Arab populations.

Another reason for differences in levels of sleep disturbances may be the major of the students. Preisegolaviciute et al. (2010) recruited medicine, law, and business students and found that medical students reported significantly higher PSQI global scores than other groups ( $F = 4.8$ ,  $P = .009$ ). They gave many reasons for these differences such as medical students woke up earlier, had shorter average length of sleep, and greater daytime dysfunction to meet the demands of the required coursework compared to the other student groups. The results of the nursing students' sleep behavior in the current study are similar to the results from the medical students as students in that both majors are required to attend early morning clinical courses. Another high percentage of poor sleepers (58%,  $n = 620$ ) were found among business students in Hong Kong (Tsui & Wing, 2009). Similar results were reported in other studies that recruited the general university population. Poor sleepers percentage ranged from 34.1% ( $n = 1125$ ) (Lund et al., 2010) to 60.3% ( $n = 710$ ) (Mesquita & Reimão, 2010). This suggests that whether studies recruited students from one major or from the general university population, students experienced sleep disturbances.

In terms of the various components of sleep measured by the PSQI, participants in the current study reported higher than average scores for all seven components except for component 7 "daytime dysfunction". Contradictory results for component 7 "daytime dysfunction" were reported by earlier authors (Tsui & Wing, 2009). Out of 620 students, 35% of business students reported excessive daytime sleepiness. Also, business students with part time jobs reported excessive daytime sleepiness than those without part time jobs (37.9% versus 29.3%;  $\chi^2 = 4.8$ ,  $p < .05$ ) (Tsui & Wing). The results in the current study suggested that students who were employed could not have day time naps. If the students are working part-time or full-time to support their education, they also are unable to nap in the afternoons and this may contribute to reduced sleep time and, consequently, create sleep disturbances.

In the current study, good sleepers reported significantly higher mental functioning, social functioning, and less interference in functioning due to bodily pain than poor sleepers. In addition, the good sleepers scored higher on the remaining five subscales of the SF-36, although it was not statistically significant. These results are not surprising because almost all students have sleep disturbances. Even though the students are sleepy, they have to stay awake to attend their classes which extend from early morning to evening. In other populations, prior researchers also documented a relationship between sleep quality and physical and psychosocial functioning. Among diabetic patients, Luyster and Dunbar-Jacob (2011) reported a significant negative correlation between sleep quality as measured by PSQI and the SF 36 8 subscales (all  $p < .001$ ). The correlations ranged from  $-.30$  for physical functioning to  $-.47$  for vitality subscale. Also, sleep quality was a significant predictor of SF- 36 physical component scores ( $\beta = -0.40$ ,  $p < .05$ ) (Luyster & Dunbar-Jacob). In a large study ( $n = 511$ ) of a typical Jordanian household, researchers established normative SF- 36 data in north Jordan (Khader, et al., 2011). The researchers studied different age groups, one of which ranged from 18-24 years, comparable to the current study. The scores of the good and poor sleepers in the current study were close to the Jordanian normative data for the (18-24) year's category on all 8 SF-36 subscales (Khader et al., 2011).

The current study did not reveal significant differences between poor and good sleepers in terms of gender. Although there was no significant difference, female students reported slightly lower PSQI global scores (7.93, SD= 3.16) than male students (M= 8.08, SD= 3.16). Two studies reported no significant differences between males and females in terms of sleep quality (Mesquita & Reimão, 2010; Tsui & Wing, 2009). In contrast, Preisegolaviciute et al. (2010) reported that female students had significantly higher global PSQI scores than male students (6.3 vs. 5.7 respectively;  $t = -1.9, p = 0.048$ ). The researchers did not give reasons for these results. On the other hand, Lund et al. (2010) reported that males had significantly later bed times and rise times than females ( $t(998) = 5.43, 2.18$  respectively,  $p < .001$ ). The latter researchers reported that 20% of male students reported stress-related sleep troubles than women. In terms of attending clinical courses, although most of the students in the current study (76%) had to be in the clinical area as early as 0700 hours, there were no significant differences in global PSQI scores in terms of attending early clinical courses between good and poor sleepers. In contrast, Tsui and Wing (2009) reported that students who attended morning lectures had shorter sleep duration (6.76 versus 7.15 hours,  $t = 3.56, p < .001$ ). Further studies are warranted to explain the relationship between morning lectures and sleep duration.

Students, who were employed, part-time or full-time, reported significantly greater sleep disturbances than students who were not employed. Similar results were reported by Tsui and Wing (2009) among business students. In their study, students with part-time jobs reported excessive daytime sleepiness than those without part-time jobs ( $\chi^2 = 4.8, p < .05$ ). In the current study, almost half of the sample already had their diplomas in nursing and were taking additional bridge coursework to obtain their bachelor's degree. The students are either a full-time or part-time employees with  $\leq 40$  work hours per week. One of the main reasons for poor sleep in the current study is employment. The majority of the students are working to manage the financial demands of a higher education. Tsui and Wing reported a greater percentage of poor sleepers among business students who were employed part-time compared to those who were not. Hours spent working consume a large part of the student's time that could be used for sleep. Further, there is little time left for daytime naps as nursing students have to attend classes in the afternoon. Thus, there is no compensation for lower sleep hours. Additionally, as primary breadwinners for the family, they are responsible for providing for their family and having to go to school full-time in addition to working part- or full-time makes the situation more difficult and consequently disturbs sleep.

Results from the current study revealed no significant differences between good and poor sleepers in terms of GPA. Similarly, Sweileh et al. (2011) reported no significant relationship between academic achievement and parasomnia or other sleep problems, but they found that students with higher frequency of nightmares had lower academic achievement. Future studies are needed to examine the effects of sleep quality on scholastic performance and other educational and social outcomes to better understand and appreciate the negative impact of poor sleep hygiene on student outcomes. Because the prevalence of sleep disturbances is high among Jordanian students, it is important that college administrative personnel and faculty are aware of the sleep disturbances that Jordanian students experience. These findings emphasize that the college administrative personnel and the faculty may provide more scholarships or financial aid so that students do not have to work while attending school. Further, coursework could be provided on-line to help students "attend" school when it is convenient for them and thus they may not lose as much sleep because of a structured classroom schedule.

## 5. Conclusion

In conclusion, this study shows that sleep disturbances were prevalent among nursing students in Jordan. Also, the results from this study were comparable to other studies. No significant relationships were found between sleep disturbances and demographic variables except for employment. Developing and testing a sleep hygiene intervention for students would allow nursing students to receive more knowledge about sleep problems and consequences and ways to improve their sleep behavior. Further, more descriptive and intervention studies are needed to address the issues that are related to students' sleep behavior in Jordan.

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**Table 1**  
*PSQI Global and Components Means and Standard Deviations (N=118)*

PSQI component	Total possible scores	Mean	Standard deviation	Range in sample
Component 1 (Subjective sleep quality)	0-3	1.32	0.92	0- 3
Component 2 (sleep latency)	0-3	1.45	0.89	0- 3
Component 3 (sleep duration)	0-3	1.47	1.00	0- 3
Component 4 (sleep efficiency)	0-3	0.48	0.82	0-3
Component 5 (sleep disturbances)	0-3	1.34	0.60	0-3
Component 6 (sleep medication)	0-3	1.24	0.94	0-3
Component 7(Daytime dysfunction)	0-3	0.71	0.71	0-3
Global PSQI	0-21	8.01	3.15	1.3-14

**Table 2**  
*Comparisons between Good and Poor Sleepers in Sociodemographic Characteristics*

Variable	Good sleepers	Poor sleepers	<i>t</i> -test statistic df = 117
	M (SD) N = 17	M (SD) N = 101	
Age	23.35 (4.8)	24.24 (3.3)	-0.956, <i>p</i> = 0.34
GPA	73.82 (6.2)	72.13 (7.7)	0.683, <i>p</i> = 0.49
	N (%)	N (%)	$\chi^2$ statistic (df=1)
Gender			
Males	10 (17%)	50 (83%)	0.56, <i>p</i> = 0.45
Females	7 (12%)	52 (88%)	
Employed			
Full or part-time	3 (5%)	61 (95%)	11.02, <i>p</i> = 0.001
Not working	14 (26%)	39 (74%)	
Work status			
Full-time	2 (5%)	40 (95%)	0.002, <i>p</i> = 0.97
Part-time	1 (5%)	21 (95%)	
Enrolled in clinical			
Yes	15 (17%)	75 (83%)	1.30, <i>p</i> = 0.254
No	2 (8%)	24 (92%)	

**Table 3**  
*Differences between Good and Poor Sleepers in SF-36 Subscales*

SF-36 subscale	Good sleepers (n=17) M (SD)	Poor sleepers (n=101) M (SD)	<i>t</i> statistic (df = 117)
Physical functioning	80.7 (21.2)	77.3 (23.5)	0.06
Role physical	73.5 (35.9)	60.1 (36.1)	1.41
Role emotional	70.6 (40.6)	53.5 (39.6)	1.64
Vitality	57.6(12.2)	51.4(18.5)	1.35
Mental functioning	65.5(12.7)	53.6(21.1)	2.28*
Social functioning	74.9 (12.9)	59.5(22.9)	4.03*
Pain	88.8(16.3)	70.0(23.5)	4.08*
General health	62.4(13.2)	59.3(13.2)	0.94

\**p* < 0.05

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