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Original Article

COMPARATIVE STUDY OF SLEEP QUALITY AMONG MORNING AND EVENING SHIFT PHARMACY STUDENTS

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ABSTRACT

Objective: To investigate sleep quantity and sleep quality in pharmacy students on comparative grounds, aimed to help them make better decisions regarding their sleep habits.

Methods: Pittsburg sleep quality index (PSQI) was used to evaluate the sleep quantity and quality. Participating pharmacy students from morning (n=88) and evening (n=100) filled questionnaires successfully. After calculating percentage of students with their sleeping times, sleeping quality score data of both shift students was statistically analyzed for two sample t-test. Results were computed by Minitab software version 14.0

Results: The age range of students under study was between 18 and 21 years. The bedtime of both shift students morning (62.5%) and evening (82%) was late at midnight. While the rise time reported by 52.27% from morning shift and 84% from participating evening shift students was too early in the morning. Actual hours of sleep recorded were lesser than required in 96.59% morning and 64% evening shift students. Comparative statistical analyzes of PSQI scores for morning, evening shift students and among gender indicated poor sleep quality in pharmacy students at highly significant level ($p < 0.01$). Study confirmed poor sleep quality among participants by global scores more than 5.

Conclusion: Study concluded significant poor sleeping habits/sleep quality among pharmacy students that may affect their educational process and growth. There is stern need to promote the awareness of above mentioned investigated facts and must educate the adolescent age group students for adapting appropriate and healthy pattern of sleep required.

Keywords: Sleep quality, Pharmacy Students.

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INTRODUCTION

Normally, a good quality of sleep is important to facilitate university students to understand, evaluate, and absorb massive amount of knowledge throughout their study period. It is considered that having a regular bed time plan can give strength to the circadian rhythm, and is valuable for achieving a good quality of sleep[1]. On contrary just one-night alteration to sleep schedule can be enough to induce difficulties with sleep starting and safeguarding. In this context many students were seen loosing their active role in university life. It is argued that the students of professional degree programs including Pharm.D have a heavy academic load so they are deprived of their required sleep during first year of study in particular. Apart of being in different class shifts (morning & evening), sleepiness in university classrooms is frequently ob-

served, predominantly in classes with greater attendance, where drowsiness and even "nodding off" is common[2-3].This indicates inadequate and poor quality sleep, affecting attention of students to follow their classroom studies, which directs to tardiness or even absence from their classes. Additionally, sleeping in circumstances not usually meant for sleep like at work place, during lectures and social gatherings, is accepted in Pakistani society. Consequently, undergraduate students are observed sleeping any where in laboratory, library and lecture halls, as they know it is usually tolerated. However, such problems of sleep are reported from various regions and are frequent among Asian university students [4-6].

Multiple ideas came to exist about sleep insufficiency that it is not only a problem of professional degree students but studies on non-professional/general discipline populations have shown that adolescent age all across the world fail to get an adequate amount of sleep [7]. Good quality sleep is experienced as essential as proper nutrition and daily exercise, thus implied as the 'brain nutrition'. If it is insufficient that can reason to affect concentration and academic consistency of the students [8]. However a majority of adolescents including undergraduate students are suffering from the problems associated with sleep quality and quantity, which is of a great concern. Such type of studies is seen scant in the pharmacy students particularly in Pakistan. This research investigates sleep quantity and sleep quality in pharmacy students on comparative grounds. It is aimed to help undergraduate students make better decisions regarding their sleep habits.

MATERIAL AND METHOD

Subject Selection

The subjects of this study consisted of 220 university students, admitted in first semester of first professional Pham.D for the year 2010 at Faculty of pharmacy, University of Sindh Jamshoro. Ethical permission to conduct this study was obtained from the Ethics Committee of the Department (ECD) to which the authors belonged. Participating male and female students were selected randomly from each morning and evening shifts, the class starting time for former and later were 9.00 AM and 2.30 PM Pakistan standard time (PST) respectively. Participating subjects 'under medical treatment' and those who left the 'questionnaire items un-answered' were excluded from study. The responses of 188 (85.5%) students out of 220, who successfully completed the questionnaire, were included in this study as shown in figure 1.

Instrument

Original English version of the Pittsburgh Sleep Quality Index (PSQI) was used in this survey, it is a widely used questionnaire on the basis of well established validity and reliability [9].PSQI is suitable for adolescent age population and is a self-rated questionnaire for assessing sleep quality over a time interval of one month. It comprises 19 self-rated questions and 5 other questions which are rated by roommate or bed partner. These last 5 question set was ignored because of the participating students were single. PSQI distinguishes the quality of sleep by measuring seven component scores including; Sleep Latency, Sleep duration, Sleep Efficiency, Sleep Disturbances, Sleep Medicine use, Day Dysfunction, Overall Quality and Global Score. The data scoring was carried out as per procedure instructed by author, PSQI answer scoring is based on a 0 to 3 scale, whereby 3 reflects the negative extreme on the Likert Scale. The sum of scores for seven components of PSQI yields a global score, where the values greater than 5 is indicative of poor sleep and a score lesser than 5 specify good sleeping quality.

Data analysis

The means of 'bed time' and 'rise time' of the participating students from morning and evening shifts were calculated and grouped according to have had sleep timing tendency 'Early' and 'Late'. The 'sleeping duration' of both shift students in which the means of 'time to asleep' and 'actual sleep hours' were calculated, and students were further classed as 'greater' and 'lesser' than required reference time of 30 minutes and 08 hours respectively. Statistical analyses were carried out for the confirmation of significant differences between seven component scores rated by morning and evening shift male and female students. Data were statistically analyzed for two sample t-test at 99% confidence intervals and results were computed by Minitab software version 14.0

RESULTS

Findings of present survey pointed out high prevalence of irregular sleeping habits among pharmacy students from morning (n=88) and evening (n=100) with mean age 19.08 ± 0.79 and 19.05 ± 0.78 years respectively. According to sleeping tendency, high percentage of students from morning shift (62.5%) and from evening (82%) reported bed time 'late' at midnight 12:42 and 12:57 PST respectively. Similar tendency of late rising group students was seen in 'rise time' as morning (52.27%) and (84%) from evening shift students getup at 6:14 and 6:15 AM though it is early time. On the other side 'early rising' time of both shift students, morning (47.72%) and evening (16%) was 5:10 and 5:01AM, which shows consistent quantitatively less sleeping habit patterns (Table 1).

Table 2 shows sleep duration of morning and evening shift students which comprise time 'fall asleep' and 'actual sleep hours' per night. In view of the normal required time to asleep majority of morning shift students (93.19%) reported time taking to fall asleep 17.23 minutes (mean time). Whereas 88% of evening shift students were recorded to have mean time 18.81 minutes to fall asleep. As per required reference sleep of 8 hours for adolescent age, the actual sleep hours calculated in mean were less than 8 hours among both shifts i.e. 6.13 and 6.02 mean hours for morning and evening respectively.

Comparative analysis of PSQI components indicated no significant differences in sleep efficiency, use of sleep medicine and overall quality of both morning and evening shift students

TABLE 1. SLEEPING TENDENCY OF MORNING AND EVENING SHIFT PHARMACY STUDENTS.

Sleeping Tendency	Morning (n=88) Students' Number & (%)	Mean time Hours : Minutes	Evening (100) Students' Number & (%)	Mean time Hours : Minutes
Bed time				
Early sleeping	33 (37.5)	22:46	18 (18)	23:05
Late sleeping	55 (62.5)	12:42	82 (82)	12:57
Rise time	42 (47.72)	5:10	16 (16)	5:01
Early rising	46 (52.27)	6:14	84 (84)	6:15
Late rising				

TABLE 2.
SLEEP DURATION OF MORNING AND EVENING SHIFT PHARMACY STUDENTS AGAINST REFERENCE TIMING TO FALL ASLEEP AND ACTUAL SLEEP HOURS.

Sleep duration	Morning (n=88) Students' Number & (%)	Mean time Hours:Minutes	Evening (100) Students' Number & (%)	Mean time Hours:Minutes
Time fall asleep				
= 30 minutes	82 (93.19)	17.23	88 (88)	18.81
> 30 minutes	06 (6.81)	53.24	12 (12)	52.91
Actual sleep hours				
= 8 Hours	85 (96.59)	6.13	64 (64)	6.12
> 8 Hours	03 (3.40)	8.06	36 (36)	8.16

TABLE 3. COMPARISON OF SLEEP QUALITY BETWEEN MORNING AND EVENING SHIFT STUDENTS

PSQI components	Morning (n=88) Mean ± S.D	Evening (n=100) Mean ± S.D	*p value
Sleep Latency	1.83 ± 1.49	1.160 ± 0.813	0.000 *
Sleep duration	0.977 ± 0.694	0.440 ± 0.701	0.000 *
Sleep Efficiency	0.148 ± 0.468	0.110 ± 0.399	0.556
Sleep Disturbances	6.57 ± 3.76	1.100 ± 0.541	0.000 *
Use of sleep Medicine	0.205 ± 0.529	0.080 ± 0.307	0.054
Day Dysfunction	1.023 ± 0.758	0.690 ± 0.720	0.002 *
Overall Quality	0.852 ± 0.670	0.720 ± 0.712	0.191
Global	11.58 ± 5.48	4.31 ± 1.85	0.000*

* $p<0.01$

TABLE 4.
COMPARISON OF SLEEP QUALITY BETWEEN MALE AND FEMALE STUDENTS OF MORNING SHIFT

PSQI components for Morning Batch	Male (n=46) Mean ± S.D	Female (n= 42) Mean ± S.D	p-value*
Sleep Latency	1.59 ± 1.31	2.10 ± 1.64	0.114
Sleep Duration	0.848 ± 0.666	1.119 ± 0.705	0.068
Sleep Efficiency	0.065 ± 0.250	0.238 ± 0.617	0.096
Sleep Disturbances	6.52 ± 3.98	6.62 ± 3.56	0.904
Use of sleep Medicine	0.261 ± 0.612	0.143 ± 0.417	0.290
Day Dysfunctions	1.022 ± 0.774	1.024 ± 0.749	0.990
Overall	0.761 ± 0.603	0.952 ± 0.731	0.186
Global	11.09 ± 5.29	12.12 ± 5.70	0.186

*p<0.01

TABLE 5.
COMPARISON OF SLEEP QUALITY BETWEEN MALE AND FEMALE STUDENTS OF EVENING SHIFT

PSQI components for Evening Batch	Male (n= 59) Mean ± S.D	Female (n= 41) Mean ± S.D	p value*
Sleep Latency	1.102 ± 0.842	1.244 ± 0.799	0.390
Sleep Duration	0.458 ± 0.625	0.415 ± 0.805	0.775
Sleep Efficiency	0.169 ± 0.497	0.024 ± 0.156	0.039
Sleep Disturbances	1.085 ± 0.466	1.122 ± 0.640	0.751
Use of sleep Medicine	0.068 ± 0.254	0.098 ± 0.374	0.659
Day Dysfunctions	0.780 ± 0.721	0.561 ± 0.709	0.135
Overall	0.746 ± 0.801	0.683 ± 0.567	0.647
Global	4.42 ± 1.90	4.15 ± 1.80	0.460

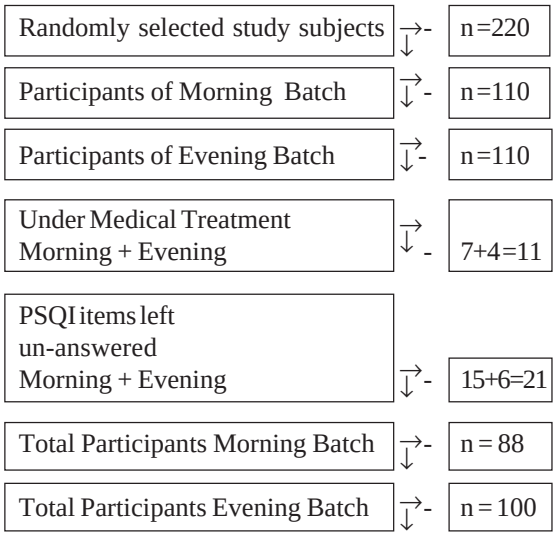
*p<0.01

(Table 3). Whereas, mean scores for sleep latency, sleep duration, sleep disturbances, day dysfunctions and the global score were significantly high (p<0.01) in the morning shift students as compared to the evening. Gender differences analyzed separately (Table 4&5) for morning and evening shift students which did not show significant differences in seven components of PSQI between male and female participants from each shift. Though global score level revealed poor sleep among all participants without discrimination of gender and shifts.

DISCUSSION

Overall, findings of this study revealed disturbed sleeping habits among pharmacy students enrolled in morning and evening shifts at university of Sindh. Means of bed time and rise time distinguished the irregularities in sleeping pattern of maximum percent of study participants though were examined on the basis of their sleeping tendencies (Table 1). Late sleeping and early wake up reported in pharmacy students may be related with complete social transitions to fresh working environment and to

FIGURE 1.
FLOW CHART OF THE STUDENT PARTICIPATION



follow the institutional schedules, which was consistent to studies conducted on first year undergraduate students of various universities of the world [10-12]. Present investigation indicated late bed time, early wakeup time and short duration of sleep which were consistent to the report by Hicks, 1991 [13] on sleeping routines in university students, stating the median sleep time dropped by one hour. Such routines may block students' efforts to focus on the next day studies. Discussing the sleep effects Buboltz, 2006 [14] suggested that lower sleep quantity i.e. 'amount of sleep' and quality i.e. 'how well one sleeps', both are associated to poorer mental health and academic performance. Table 2 shows most of the students from morning and evening shifts sleep quantity lesser than the recommended sleep duration of 8 hours [15-16]. This reflects to some correlation studies indicating poorer academic activities among students who sleep less [17].

Factors related to upset the sleep quality of pharmacy students in their first year of study may be, increasing adolescent age [18-19] and generation trends [20]. Sleep quality responses from morning and evening shift students measured through PSQI and its comparison revealed the declines in sleep quality trends among corresponding age groups (Table 3). The component scores for sleep latency, sleep duration, sleep disturbances and day dysfunctions rated higher by morning shift students were significantly different ($p>0.01$) than evening that revealed decreasing tendency in quality sleep and placing morning shift students under threat. And that was confirmed by global score more than 5 for morning and evening shift students which distinguished having poor quality of sleep.

Gender analyses of PSQI components responses were without significant differences among morning shift male and female pharmacy students (Table 4). Data for seven component scores and the global score on likert scale suggested poor sleep in both sex students enrolled in morning shift. Such hindrances in quality sleep of male and female students were pointed out in previous studies, those reflected certain factors like; early institutional start times [21], packed schedules [22] academic load and social interests [23]. As evening shift students had to follow the institutional start time in late hours so were not compelled to wake up early and supposed to be good sleepers. But comparative data (Table 5) revealed similar behavior for seven components and global score that stood for poor sleep quality among evening shift students.

Poor sleep quantity and quality between male and female students of morning and evening shifts was consistent to studies by Hawkins, 1992, and Carney, 2006 [24-25]. Quality of sleep depends up on the environment provided; any change after new entry in university has great concern with the sleep habits of university students. Inclusion of some reported factors like fresh academic demands, new social opportunities, change in sleeping circumstances, change in eating habits, diminished parental guidance, ups and downs in class schedules and part-time job loads [26] put pressure on undergraduate students generally and the pharmacy students particularly for disrupting circadian rhythm, adequate sleep and level of its quality. Consequently both male and female pharmacy students suffer some physiological and behavioral problems including memory disturbances and less concentration on class studies. As some of the authors [27-30] revealed sleep after a learning period enhances memories for skills. Thus, students need to learn more to regulate their sleeping habits and quality prior to fresh entry in university environment.

CONCLUSION

It is concluded that the students enrolled in morning and evening shifts having different work schedule manifested poor sleeping quality as rated through PSQI. Their irregular sleeping habits may affect their attitudes towards learning tasks and classroom behavior for academic achievements. It is also concluded that the poor sleeping quality of these students leads them to psychological and physiological disturbances which create confusion and reduce their efficiency to achieve required criteria to be successful during their study period. It seems harmful for the wellbeing of students as well as standards of the educational institutions. There is stern need to promote the awareness of above mentioned investigated facts and must educate the adolescent age group students for adapting appropriate and healthy pattern of sleep required.

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