Relationship between quality of sleep and academic performance among Female Nursing Students

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Abstract: Adolescents reporting inadequate sleep and or poor sleep quality do not perform as well inschool as students without sleep complaints. This study aimed to assess relationship between quality of sleep and academic performance among femalenursing students. Descriptive research design was used. The study was carried out at College of Nursing and Allied Health Sciences in Jazan city at kingdom of Saudi Arabia. The study sample was comprised of two hundred female nursing students who agree to participate for the study. The tools of this study were consisting of three instruments to gather the required data. The first; includes socio-demographics characteristics such as age, academic level, the second; Pittsburgh Sleep Quality Index (PSQI):This scale intended to discriminate between good and poor sleepers, the third; Epworth Sleepiness Scale for Daytime Sleep Deprivation Assessment Sheet: This scale used to evaluate daytime sleepiness using the Epworth Sleepiness Scale (ESS). The results of this study showed that 82.5% of students were in second academic year,more than two thirds of students have from six to less than 4 sleeping hours, less than half of them have academic score "average students (GPA <3.75/5). Less than three quarters of them can't fall asleep within 30 minutes after going to bedfrom one to more than three times per week. Furthermore, near two thirds of students have poor total sleep quality and students with good total sleep quality have good academic score with positive correlation with highly statistically significant difference. This result concluded that many factors are affecting sleep quality for students as more than half of them can't fall asleep within 30 minutes after going to bed and have pain from one to three times per week,two thirds of students have good sleep quality. Students with good total sleep quality have good academic score with positive correlation with highly statistically significant difference.It is recommended that undergraduate nursing students should be educated about the importance of adequate sleep to their academic performance and high score achievement in their study. Sufficient daily sleep may also have an impact on their general physical and psychological wellbeing.

I.   Introduction

Sleep is one of our basic needs that plays a very important role in a human being's health. It is important for our physical, intellectual and emotional health. Sleep loss not only makes people feel sleepy in the daytime, it is even a possible risk factor for Alzheimer's disease. Sleep is an active, repetitive and reversible behavior serving several different functions, such as repair and growth, learning or memory consolidation, and restorative processes. All these occur throughout the brain and the body[1][2].

Sleep is critical for memory consolidation, learning, decision making, and critical thinking.Sleep is thus necessary for the optimal operation of key cognitive functions related to academic, and perhaps social success in higher education. When students arrive at college their sleep habits are often one of their first daily routines to change and not usually for the better. College students typically shift to an irregular sleep–wake cycle characterized by short sleep length on weekdays and phase delays (later wake-up time) on weekends, although this general pattern is influenced by an individual's study and work schedules.Both sleep deprivation and poor sleep quality are particularly prominent in young adult and college student populations[3].Indeed, based on research within other academic fields such as medicine and biology, we know that night's rest is essential for helping maintain mood, motivation, memory and cognitive performance. While asleep, the brain integrates new knowledge and forms new associations[4].

Recent data have suggested that sleep is important for memory consolidation and learning. Sleep deprivation results in sleepiness and impaired neurocognitive and psychomotor performance. Recent reviews have indicated an important relationship between sleep patterns with learning abilities and consequent academic performance. Certain sleep habits were associated with lower academic performance. A late bedtime on weekdays and weekends was associated with lower academic performance[5]. Therefore, sleep deprivation would

result in impairment of words, psychological and neurocognitive [6]. Most sleep specialists indicate that adult humans require approximately 8 hours of sleep per day [7]. It has been reported that the history of sleep research can be traced back to the 19th century [8].

Habitual sleep patterns undergo substantial changes from childhood to adolescence and young adulthood. These changes are characterized by progressive delay in the sleep phase without a decrease in need for sleep (internal factors). At the same time, schedules (external factors) frequently require earlier wake times and lead to shorter total sleep time (TST). Sleep debt accumulated during the week often leads to prolonged sleep periods or catch-up sleep on weekends causing severeday-to-day irregularities of sleep patterns in adolescents and young adults. Insufficient sleep time, with associatedsleepiness, fatigue, and inattentiveness, has been identifiedas a major cause of poor academic performance among high school and college-aged students. While it is clear that insufficient sleep is a major factor governing mood, alertness, concentration, learning, and ultimately performance in the academic environment, the precise role of sleep quantity versus the impact of circadian rhythms on performance remains ill-defined [9].

Lack of sleep in college students has been identified as one of the academic situational constraints that diminish students' performance. Furthermore, research has found that students who stay up late tend to have lower academic performance, poor quality of sleep and maladjustment to college life[10].Higher academic performance during the years at university is highly related to career success. Moreover, academic performance influences future educational attainment and income, which, in turn, affect health and quality of life. Therefore, determining factors related with academic grades is important to both universities and their undergraduates [11].

Good academic achievement is directly related to good scoring in various entrance examinations and job opportunities so it has been always a matter of concern for both parents as well as students. Achievement in school is affected by a number of factors, including the quality of the school, characteristics of the student's family such as socioeconomic status and parent's educational level, and the characteristics of the child. Motivation and home environment have a positive relationship with academic achievement Suboptimal sleep affects students learning process and academic achievement[12].

II.   Significant of the study

Sleep has been found to be on the bottom of the priority list of most individual especially students because they feel they must always meet up with deadlines. Most of the studies already carried out have considered the negative effects of insufficient sleep on students and adults but there is the need to study and understand how a poor academic performance can affect the sleep pattern as well as how poor or inadequate sleep pattern can affect poor academic performance among University undergraduates nursing students[13].Most of nursing students' are vulnerable group young adult whose lifestyle are affected their quality of sleep then leads to negatively affected their academic performance.

Aim:
This study aimed to assess relationship between quality of sleep and academic performance among femalenursing students.

Research Questions:
1.   What are the factors affecting quality of sleep for female nursing students?
2.   Is there a relation between sleep quality and academic performance of female nursing students?

Methodology:
Research Design:
Descriptive research design was used to assess relationship between quality of sleep and academic performance among femalenursing students.

Setting:
The study was carried out at Faculty of Nursing and Allied Health Sciences in Jazan city at kingdom of Saudi Arabia.

Population:
The study sample was comprised of two hundred (200) female nursing students who agree to participate for the study. All students who were present when the questionnaire was distributed for at a period from (first of September 2014 to end of November 2014). Sample of female nursing students aged 18 and over was selected.

Data collection tools: The tools of this study were consisting of three instruments to gather the required data for the study as the following:

1. Socio-Demographic Characteristics Sheet:

This sheets include socio-demographics characteristics of female nursing student such as age, academic level, living with, place of residence, income, sleeping hours, taking nap, study hours, academic scores for gradepoint average (GPA). School performance was based on the self-reportedGPA (grade point average), which is a known methodto define academic performance in sleep research. The school performance was stratified as "excellent students" (GPA ≥3.75/5) or "average students (GPA <3.75/5). This dichotomous division of academicperformance has been previously used for the assessment of the relationship between sleep habits andschool performance [14].

2. Pittsburgh Sleep Quality Index (PSQI):

This scale intended to discriminate between good and poor sleepers. The scale is adapted from (**Buysse et al., 1989**)[15]and translated for this study.This include quality of sleep, can't breathe comfortably, snoring or cough loudly and feel too cold..etc. The respondent completes questions based on a four-point Likert scalewhich includes four grades about frequency of occurrence, 0=no time; 1= less than once per week per; 2=1-2 per week; 3= 3 or more times per week.; these items are designed to measure sleep difficulty. The items are summed to produce an overall score from 0 to 42; lower scores indicate better sleep quality than higher scores Cronbach's alpha (for internal reliability) has been calculated as .82 and .83.

Scoring system for total quality of sleep:
Score is less than 60% = less than 25.2 =**means the students** have **good** quality of sleep.
Score is between 60-75%= 25.2 – 31.5 =**means the students** have **fair** quality of sleep.
Score is more than 75% = more than 31.5 = **means the students** have **bad** quality of sleep.

3. Epworth Sleepiness Scale for Daytime Sleep DeprivationAssessment Sheet:

This scale used to evaluate daytime sleepiness using the Epworth Sleepiness Scale (ESS)[16]. ESS is a standardized validated questionnaire that assesses the likelihood that the subject will fall asleep during certain activities. It consists of eight items describing different situations and activities of daily living. ESS scores range from 0–24, and based on previous studies, the upper limit of a normal score is estimated to be 10. ESS scores >10 indicate increased daytime sleepiness.

Procedure for Data Collection:

Data collected for 3 days per week (Sunday, Monday, Tuesday) from 8 A.M to 12 P.M, the implementation phase was done through interview with each female nursing student after arranging with her schedule by the researcher individually using study tools. The aim of the study was explained to give assurance of confidentiality of information offered, and to gain their maximum cooperation. Consent was obtained (orally). Each student given the tool to fill it. Then interviewing questionnaire was filled by the students at the beginning of each session. Each student took about 10 minutes to answer this question. The second tool students' quality of sleep assessment sheet took 15 minutes to answer its questions. The third tool which factors affecting student's quality of sleep took about 20 minutes to answer its questions; each symptom was categorized into 4 levels. ask each student previous at least one month prospective to fill these questions with details. First category took score 0=no time; second, 1= less than once per week, third, 2=1-2 per week; finally,3= 3 or more times per week.

A pilot study:

It was conducted on 10 participants that were not used for the final study, in order to test the applicability of tools and clarity and simplicity of the included questions as well as to estimate the average time needed to fill in the sheets. Those who shared in the pilot study were excluded from the main study sample. Necessary modifications were carried out based on finding of pilot study to develop the final form of the tools.

Administrative Design:

An official permission was obtained from Dean of the college then oral consent was obtained from the female students who participate in this study.

Human Rights and Ethical Considerations:

The subjects were chosen after their informed consent was obtained to participate in the study. The researchers approached each student by giving her an overview of the study, explained the procedures and reassured the subjects that their privacy would be protected, and that any obtained information would be strictly confidential.

Statistical Design:

The collected data were coded for entry and analysis (SPSS) statistical software package version 17. Data were presented using descriptive statistics in the form of frequencies, percentage, Qui Square and Pearson correlation.

III. Results

Table (1):Demographic Characteristics and Other Variables of Study Population

	No. (200)	%
Academic year:		
Second	165	82.5
Third	30	15
Fourth	5	2.5
Living with:		
1. With parents.	159	79.5
2. Father.	16	8
3. Mother.	12	6
4. Colleagues.	13	6.5
Residence:		
1. Rural.	103	51.5
2. Urban.	97	48.5
Income:		
1. Low.	11	5.5
2. Middle.	161	80.5
3. High.	28	14
Sleeping Hours:		
1. More than 10.	6	3
2. From 7 – 10.	60	30
3. From 4 -6.	107	53
4. Less than 4.	27	14
Taking Nap:		
Yes	71	35.5
No	129	64.5
Study Hours:		
1. More than 6	78	39
2. From 4 - 6	79	39.5
3. From 2 - 4	32	16
4. Less than 2	11	5.5
Academic scores (GPA):		
1. Excellent GPA > 3.75	109	54.5
2. Average GPA < 3.75 .	91	45.5
Epworth Sleepiness Score:		
1. No daytime sleepiness (ESS <11) (normal)	130	65
2. Daytime sleepiness (ESS >11) (abnormal)	70	35
Health Problem:		
Yes	43	21.5
No	157	78.5

Table(1) shows that near two thirds of students (62.5%) age from 19-20 and 79.5% of them lives with their parents. Also, large number of them (80.5%) have middle social class while more than half of students (53%) sleep from 4-6 hours every and 39.5% of them study from 4-6 hours. Furthermore, less than half(45.5%) of the students have average academic score and (78.5%)of them have no health problems.
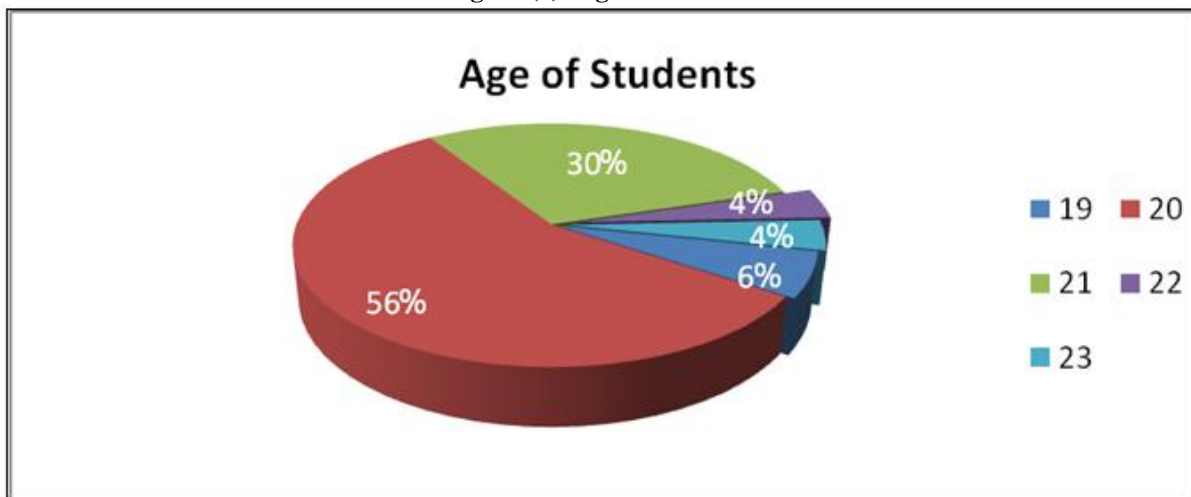
Figure (1): Age of Students

Figure (1) shows age of students.More than half of students (56%) have age 20 years, while less than one third of students (30%) have age 21 years. Furthermore, the minority of them (4%) have age 22 and 23 years of age.

Table (2):Factors Affecting Sleeping Qualityfor Students in Past Month.
This Table is An Answer of Question Number (1).

	No time through last month (0)	Less than one time per a week (1)	From 1 or 2 times per week(2)	Three times or more per week(3)	X	P
Can't fall asleep within 30 minutes after going to bed	29(18.5)	27(13.5)	55(27.5)	89(44.5)	111.500	0.000
Wake up in the middle of night or early morning	7 (3.5)	18 (9)	76 (38)	99 (49.5)	119.00	0.000
Have to get up to use bathroom	41 (20.5)	78 (39)	55 (27.5)	26 (13.5)	29.844	0.000
Can't breathe comfortably	92 (46)	45 (22.5)	37 (18.5)	26 (13)	47.859	0.000
Snoring or cough loudly	142 (71)	30 (15)	17 (8.5)	11 (5.5)	229.480	0.000
Feel too cold	28 (14)	40 (20)	56 (28)	76 (38)	25.920	0.000
Feel too hot	38 (19)	75 (37.5)	55 (27.5)	32 (16)	75.250	0.000
Have terrible dreams	36 (18)	71 (35.5)	63 (31.5)	30 (15)	24.120	0.000
Have pain	25 (12.5)	59 (29.5)	69 (34.5)	47 (23.5)	75.700	0.000
Rating quality of your sleep	**Very good**38(19)	**Fairly good**82(41)	**Fairly bad**59(29.5)	**V. bad**21(10.5)	41.800	0.000
Number of times for taking sleep drugs	144(72)	26(13)	20(10)	10(5)	334.850	0.000
Number of difficulties to get in sleeping	47(23.5)	68(34)	47(23.5)	38(19)	59.850	0.000
Problems that you faced and affected on practicing activities.	44(22)	98(49)	57(28.5)	1(0.5)	64.640	0.000
Sleeping with another one in the room or in the bed.	41(20.5)	22(11)	134(67)	3(1.5)	185.920	0.000

Table (2) show that (44.5%) of the students can't fall asleep within 30 minutes after going to bed three times or more per week. (39%) of students Have to get up to use the bathroom less than one time per a week. Also, Less than three quarters (71%) of them told that they have no time through last month for snoring or cough loudly and less than one third (31.5%) of the students have terrible dreams from 1 or 2 times per week. Furthermore, less than one quarter (23.5%) of the students have pain three times or more per week last month. Only (19%) of students last month had very good sleep quality. Near one quarter (23.5%) of them have difficulty to get in sleeping from 1 or 2 times per week. Furthermore, less than half (47%) of the students faced simple problems and affected on practicing activities with highly statistically significant difference.

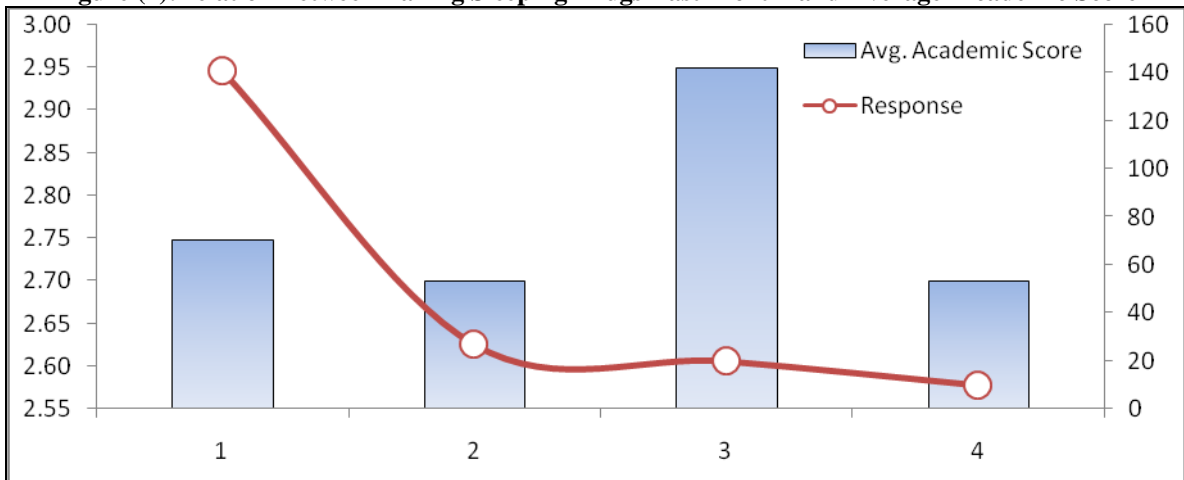**Figure (2):Relation Between Taking Sleeping Drugs Last Month and Average Academic Score**

Figure (2) shows relation between taking sleeping drugs last month and average academic score. 143 students have no time taking sleeping drugs through last month with have average academic score 2.75 and 20 students who takingdrugs from 1 or 2 times per weekhave average academic score 2.95 with no significant difference (p= 0.4).

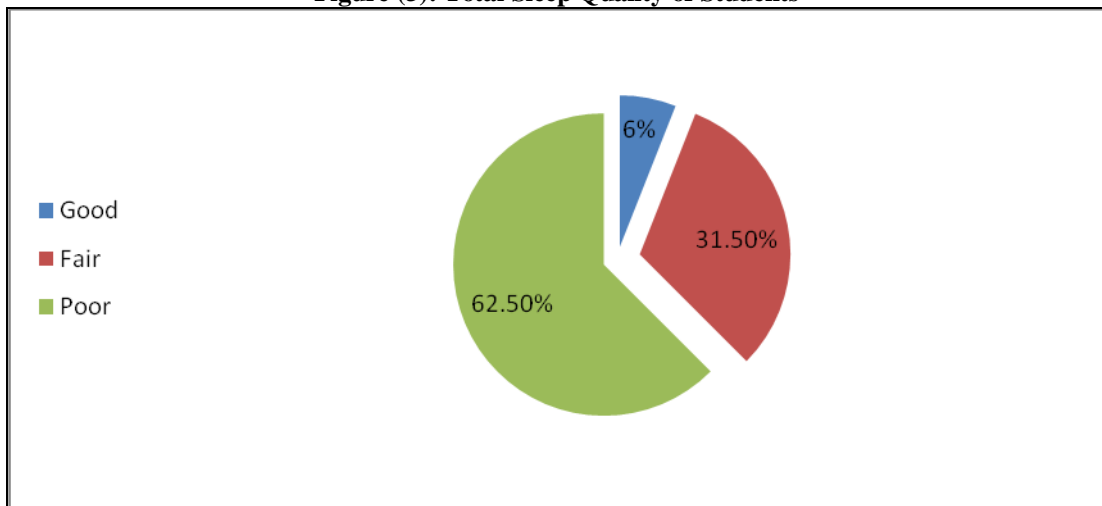**Figure (3): Total Sleep Quality of Students**

Figure (3) represents Sleep Quality. 62.5 % of students have poor sleep quality while only 6 % of them have good sleep quality.

Table (3): Correlation Between Sleep Quality and Academic Score:
This is an Answer of Question Number(2)

	Academic scores (GPA)	
	R	**P**
Total Sleep Quality	0.176*	0.013

Table (3) shows correlation between total sleep quality and academic score. Students with good total sleep quality have good academic score with positive correlation with highly statistically significant difference.

IV.   Discussion

Sleep is one of our basic needs. It is important for our physical, intellectual and emotional health [1]. Previous study by **Trocker et al.** to evaluate health related variables on academic performance found thatsleep had the largest effect on semester GPA compared to the other health related variables such as exercise,nutrition intake, mental health, stress and time management[17].Americans report getting 8 hours or more of sleep per

night [18]. If a person reduces the amount of sleep by only one hour in a night, it still has a significantimpact on next day functioning. Response time, ability to focus, andperformance at a job or school can all be adversely affected[19]. So, this study aimed to assess impact of sleep and its quality on academic performance among female nursing students.

The findings in the table (1) of the present study showed small number of students sleep less than 4 hours per day, this is agreed with **Abdulghani** who stated that findings of a small number of his population sleep less than 4hours[20].Research shows that people who sleep seven hours a night do better on memory tasks than those who do not.Individuals will vary in terms of how much sleep is the "right" amount, but in general most college students need at least six toeight hours a night.Avoid late weekend nights when you have an exam during the coming week. Theeffects of missing sleep can last for several days and it takes your body time to recover. When you have an exam, save your brain's energy and memory power by keeping a consistent sleep schedule during the entireweek, including the weekend[21] .Furthermore, the present study revealed that more than one third of students have daytime sleepiness and this is agreed with **Pagel** sleepiness during the day in 45.7% ≥ 1x / wk.(15.2 % every day);and difficulty concentrating in 54.6% ≥ 1 x / wk.(12.9% always)[22] ·The table (2) of the current study revealed that near two thirds of the students took more than half hour to fall asleep from one time to more than three times per week.This is contradicted with **Yu-Chih Chiang,**who found in his study that 25% reported that they took 30 min to one hour to fall asleep[23].

The findings of table (2)of present study revealed highest number of student have poor sleep last month. This is agreed with **Angeloneet al.,** who found in their study a relativity high proportion of students appear to sufferfrom poor sleep; one student in four reported nocturnalsymptoms of insomnia and this proportion was very higher among subjects[24].Also, this finding revealed that about two thirds of students have terrible dreams three times or more per week and more than two thirds of them have pain, this is agreed with several studies have reported that sleeplessness have a negative influence on daily activities and are related to perception of general health and quality of life[25]. These findings also, are consistent with previous epidemiological surveys [26]. Psychological consequences of insomnia and poor sleep, including depression, andincreased anxiety have previously been reported,and diseases that cause pain during sleep (e.g. arthritis, back pain) are well known to be associated with insomnia symptoms, especially with disrupted sleep [27-30]. Furthermore, the present study revealed more than one quarter of students took sleep drugs in past month and this is contradicted with **Zailinawati et al.,** whose study stated a minority of the respondents of his study usedsleep medication in the past one month[31].

Table (3) of the current study found relationship between sleep quality and academic score, two thirds of students have total poor sleep quality and this is contradicted with **Veldi et al.,** who reported that 7% of the first to the sixth yearmedical students, had poor to very poor sleep quality[32]. In their study, poor sleep quality isassociated with poor academic progress. Also, **Curcio et al.** concluded that sleep loss was negatively correlated with academicperformance[33]. Moreover, sleep loss resulted in daytime sleepiness, which was also correlatedwith poor academic performance. In this study, several factors associated with minor sleeping disorders among nursing students such as sleeping deprivation, and mid-day napping. Other studies demonstrated these risk factors for sleep disturbances in addition to socioeconomic status, life habits, and psychological factors[34].Also, **Howell et al.,** conducted a study on college students and confirmed a correlation between poor sleep quality and academic performance [35]. Thefindingsalso revealed thatstudentswho indicated they have adequatesleep perform betteracademicallythis may be relatedtotheresult of a physiological studies that confirmed that adequate sleep may be important for the consolidation of memory which could have important implications for school success in adolescence [36,37]. This implies that the amount of sleep a person getsPernightaffectstheindividual'sabilityto learn. This again supports the findings of **Hackethal** that sleep deprivation might affect certain parts of the brain, especially the frontal lobes. Thefrontallobescontrolexecutive function, which is the abilityto makedecisions, formemories, plan forthe futureand inhibitsociallyundesirable behavior and therefore concluded that children who have trouble sleeping tend to do worse in school than their peers who get a good night's sleep[38].

V.   Conclusion

This study is exploring the relationships between sleep quality and academicperformance among undergraduate nursing students.More than half of students sleep from four to six hours and less than half of them had fair academic score(less than 3.75). Many factors are affecting sleep quality for students in the past time as more than half of them can't fall asleep within 30 minutes after going to bed and have pain from one to three times per week.Two thirds of students have good sleep quality. Students with good total sleep quality have good academic score with positive correlation with highly statistically significant difference.

VI. Recommendations

It is recommended that undergraduate nursing students should have sleep awareness for high academic performance and high score achievement in their study. Sufficient daily sleep may also have animpact on their general physical and psychological wellbeing. Also, we recommend further researches with a larger scale that stressing carefully on sleep disturbance and its relation withacademic performance in nursing students and application programs for improving sleep quality for future progress in academic performance. Lastly, fixed bed times and wakingtimes,andlimitpsychosocial andenvironmentalpressure thatmay adverselyaffect academic performance.

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