

THE DESCRIPTION OF SLEEP DISORDER IN NURSING STUDENTS AT PADJADJARAN UNIVERSITY WHO EXPERIENCE SMARTPHONE ADDICTION

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ABSTRACT

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Sleep disorders can be experienced by college students, including nursing students. Since nursing students are prospective professional nurses, it is feared that sleep disorders will negatively impact during lectures and health services when becoming a nurse in the future. This study aims to determine the description of sleep disorders in nursing students at Padjadjaran University who experience smartphone addiction. Methods: The method used in this research was a quantitative descriptive method. The population in this research was the nursing students of Padjadjaran University, with a total of 668 respondents using the purposive sampling technique, obtained a total sample of 400 respondents. The instrument used in this study was the Sleep Disorders Symptom Checklist-17 (SDS-CL-17). The data obtained were analyzed using univariate analysis with results presented in percentage. This study showed that the majority of respondents (99.8%) experienced sleep disorders. Based on the sleep disorders category, the majority of respondents experienced circadian rhythmic sleep-wake disorder (91.8%) and parasomnia (76%), while less than half of the respondents also experienced insomnia (46.2%), narcolepsy (45.8%), sleep-related movement disorders (36.2%) and obstructive sleep apnea (30.8%) and experienced two or more sleep disorders (89%). The high incidence of sleep disorders indicated the need for preventive, promotive, curative, and rehabilitative solutions for nursing students to reduce the negative impact in the future.

BACKGROUND

Humans are holistic creatures whose basic needs are heterogeneous, one of which is physiological needs. Physiological aspects are the main needs that must be fulfilled, which one of the components is the need for rest and sleep (Kasiati & Rosmalawati 2016). Sleep is a state of being unconscious and can be awakened by sensory stimulation or other stimulations (Hall 2014). Humans need sleep as a function of maintaining immunity, energy storage, and recovery of brain energy stores, removing unused waste in the brain, restoring performance optimization for both cognitive and behavioral, and as a function of neural connectivity (Krueger et al. 2016). Sleep function can be fulfilled optimally if an individual has a good quality sleep.

A survey conducted by the National Sleep Foundation (NSF) involving 1,508 respondents from

the United States indicated that 87% of respondents admitted to experiencing one sleep disorder in a week with people aged 19-29 years old have the highest percentage who are having difficulty in beginning to sleep and waking up feeling fatigue (NSF 2011).

Students are also at high risk of experiencing sleep disorders since they are in the productive age category. It is proven by the research done by Petrov et al. (2014) which indicated that of the 1361 respondents, 36% of them were at risk of experiencing one sleep disorder, and as many as 6.3% were at risk of experiencing two or more episodes of sleep disorders. The results of other studies also stated that of the 70 students, 45.7% of them experienced sleep disorders (Gunanthi & Diniari 2016). While another study in 125 college students reported that over 60% were categorized as poor-quality sleepers by the Pittsburgh Sleep Quality Index (Lund, H. G., et al. 2010).

Sleep disorder is a condition where the quality, time, and duration of sleep are disturbed so that it can affect daily functions (Parekh 2017). According to the International Classification of Sleep Disorders-Third Edition (ICSD-3) sleep disorder is categorized into seven categories, namely insomnia, sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm sleep-wake disorder, sleep-related movement disorders, parasomnia, and other sleep disorders (Sateia 2014). Signs and symptoms that often occur due to individuals experiencing sleep disorders are excessive daytime sleepiness, irregular breathing, excessive movement during sleep, irregular sleep cycles, and difficulty sleeping (MFMER 2019).

Sleep disturbance experienced by students can have several negative impacts, including the increasing of stress levels, lower quality of life, lowering academic achievement, experiencing academic stress, emotional disturbances, and the onset of depressive symptoms (Gobin et al. 2015; Almojali et al. 2017; Hershner & Chervin 2014; Hallit et al. 2019; Waqas et al. 2015). Sleep disorders that occur can be caused by several factors, including lack of physical activity, high levels of stress, low levels of physical health, frequent use of alcohol and smoking, length of activity in front of electronic screens, improper diet, and addiction to smartphones (Wu et al. 2015; Rodrigues et al. 2018; Valerio et al. 2016; Wang et al. 2019; Dewi et al. 2018).

One of the factors that cause sleep disorders is an individual who is experiencing smartphone addiction. The use of smartphones today is a common thing and is often found used at various ages. The advantages offered by smartphones can make individuals use it excessively, which triggers smartphone addiction behavior. Smartphone addiction is a condition when an individual uses a smartphone excessively so that it interferes with user's daily activities (Lee et al. 2014). The incidence of smartphone addiction tends to be high in college students, this is proven by the result of research conducted on 1441 respondents, 29.8% had experienced smartphone addiction, and other studies conducted on 608 students, 35.51% had experienced smartphone addiction (Kim et al. 2017; Chen et al., 2017).

Smartphone addiction experienced by college students can put them in high risk of experiencing sleep disorders due to their habit of using smartphones before bed. Smartphones have emitted electromagnetic radiation, and if an individual is too often exposed to this radiation, it can lead to negative effects such as sleep disorders, headaches, depression,

memory loss, and hormonal imbalances (Kaur et al. 2016). Smartphones also emit light that comes from the screen, causing disruption of circadian rhythms and the secretion of the hormone melatonin (Dewi et al., 2018; Yolanda et al. 2019). A preliminary study conducted by the author by interviewing 25 nursing students of Padjadjaran University found that 23 students always played their smartphones before going to sleep, and 18 students kept their smartphones in an active mode close to their sleeping position. The result of the interview also showed that of the 25 students interviewed, only 4 had an indication of good sleep quality according to the NSF provisions and 12 students complained that they were not satisfied with the quality of their sleep.

According to the Undergraduate Nursing Education Program Guidelines, nursing students are prospective health care workers who are prepared to become professional nurses. If any nursing students experience sleep disorders, it can have an impact on their quality of life along with physical and mental health. It is feared that this condition will negatively impact during lectures as a first step to becoming professional nurses. Moreover, it is also feared that they will not be able to perform their best health services in the future. Based on this case and investigations carried out by the author, no research has been found regarding the overview of sleep disorders in students who experienced smartphone addiction at the Faculty of Nursing, Padjadjaran University. This brought the author to be interested in conducting research on the description of sleep disorders in nursing students at Padjadjaran University who experience smartphone addiction.

METHODS

This research used a descriptive quantitative method that aimed to determine the description of sleep disorders in nursing students at Padjadjaran University who experience smartphone addiction. The population in this study was active nursing students of the undergraduate program at the Faculty of Nursing, Padjadjaran University in a class of 2017, 2018, and 2019, with an amount of 668 nursing students. The sampling technique used was a purposive sampling technique with the inclusion criteria of active students class 2017, 2018, and 2019 as well as students who experienced smartphone addiction. Sampling was carried out by screening using a Smartphone Addiction Scale-Short Version (SAS-SV) questionnaire, after the screening was done, a total sample of 400 respondents was obtained.

This study used the Sleep Disorders Symptom Checklist-17 (SDS-CL-17) instrument modified by Klingman et al. (2017) consisting of 17 question items to determine if an individual has the potential to experience sleep disorders insomnia, Obstructive Sleep Apnea (OSA), narcolepsy, Restless Legs Syndrome (RLS), parasomnia, and sleep-wake circadian rhythm disorders. Respondents must choose one of the four answer options based on the signs and symptoms they have felt during the last one year. Data collection was carried out from April 20th until April 30th, 2020, with a number of 400 samples of respondents according to the criteria.

This research has obtained ethical exemption from the Ethics Committee of Padjadjaran University with letter number 306/UN6.KEP/EC/2020, then the author also asked for research permission from the Dean of the Faculty of Nursing, and data collection was carried out by using an online form by google.

RESULTS

The result were presented in the form of a frequency distribution table. The data that were presented includes of demographic data of respondents and data from research results. Data collection was carried out from April 20th until April 30th 2020 with a number of 400 samples of respondents according to the criteria.

Based on demographic data by the class, it is illustrated that less than half of the respondents came from the 2017, 2018, and 2019 classes, with the number of respondents in each class were; 143 respondents from class of 2017 (35.8%), 152 respondents from class of 2018 (38%), and 105 respondents from class of 2019 (26.2%).

Meanwhile, by gender, it is illustrated that the majority of respondents were female, with a number of 353 respondents (88.2%) and a small proportion of respondents were male with a number of 47 respondents (11.8%).

The majority of respondents had a normal BMI with a number of 274 respondents (68.5%), while the small proportion of respondents were underweight with a number of 65 respondents (16.2%), overweight with a number of 59 respondents (14, 8%) and obesity with a number of 2 respondents (0.5%).

Lastly, by place of residence categories, it is illustrated that the majority of respondents lived in houses with a number of 235 respondents (58.8%) and the rest of respondents lived in boarding/dormitories with a number of 165 respondents (41.2%).

Based on (table 2), it is illustrated that the majority of respondents experienced sleep disorders as many as 399 respondents (99.8%) and only 1 respondent (0.2%) did not experience sleep disorders respectively.

According to the result in (table 3), it is illustrated that the majority of respondents experienced circadian rhythm sleep-wake disorders with a number of 367 respondents (91%) and parasomnia with a number of 304 respondents (76%), meanwhile less than half of the respondents also experienced sleep disorders, with a number of 185 respondents experienced insomnia (46.2%), a number of 183 respondents experienced narcolepsy (45.8%), a number of 145 respondents experienced sleep-related movement disorder (36.2%) and a number of 123 respondents experienced sleep-related breathing disorder during sleep (30.8%). The highest incidence of sleep disorders by category was circadian rhythm sleep-wake disorder, with a number of 367 respondents (91%), while the lowest incidence of sleep disorders was sleep-related breathing disorder, with a number of 123 respondents (30.8%). Respondents had different sleep disorders, either experiencing one or more sleep disorders. Based on (table 4.6) also illustrated that the incidence of students experiencing two or more sleep disorders were 356 respondents (89%) of the total students who experience sleep disorders.

DISCUSSION

Based on the results on the gender of respondents (table 1), the majority of respondents were female with a total of 353 respondents (88.2%). This is in line with research conducted by Petrov et al. (2014) regarding sleep disorders in college students which stated that 76.8% of respondents were female, aged 17-25 years. Distinct hormonal and physical changes at specific time points, such as puberty, pregnancy, and menopause, during a woman's lifespan can impact her sleep health (Mallampalli, M. P., & Carter, C. L. 2014).

Based on the Body Mass Index (BMI) of respondents (table 1), more than half of respondents had a normal weight BMI with a number of 274 respondents (68.5%). Research conducted by Wang et al. (2019) regarding the relationship between sleep quality and smartphone addiction stated that the average BMI of respondents was in a normal weight category. Meanwhile, a number of 61 respondents (15.25%) were overweight and 2 respondents were obese. This is explained in research done by Klingman et al. (2017) regarding sleep disorders that the aver-

Table 1. Demographic Data of Respondents Based on Class, Gender, Body Mass Index (BMI) and Place of Residence

Demographic Data	Measurement Result	f	%
Class	2017	143	35,8
	2018	152	38
	2019	105	26,2
Gender	Female	353	88,2
	Male	47	11,8
Body Mass Index (BMI)	<18,5 or Underweight	65	16,2
	18,5 - 24,9 or Normal weight	274	68,5
	25 - 29,9 or Overweight	59	14,8
	≥30 or Obesity	2	0,5
Place of Residence	Home	235	58,8
	Boarding/dormitories	165	41,2

Tabel 2. Description of Sleep Disorders in Nursing Students who experience Smartphone Addiction

Sleep Disorders	f	%
Not experiencing sleep disorders	1	0,2
Experiencing sleep disorders	399	99,8

Table 3. Description of Sleep Disorders in Nursing Students who experience Smartphone Addiction based on Sleep Disorders Category

Sleep Disorders Category	f	%
Insomnia	185	46,2
Circadian Rhythm Sleep-wake Disorder	367	91,8
Narcolepsy	183	45,8
Obstructive Sleep Apnea	123	30,8
Sleep-related Movement Disorder	145	36,2
Parasomnia	304	76
Experiencing two or more sleep disorders	356	89

age BMI of respondents who had sleep disorders were overweight. Also explained in the book written by Grandner (2019) and Redeker & McEnany (2011) stated that individuals who are in the obese category has a high risk of experiencing sleep disorders.

Based on the place of residence of respondents (table 1), more than half of the respondents resided at home, with a number of 235 respondents (58.8%), the result of this study are in line with the research of Almojali et al. (2017) which stated that the majority of respondents who lived at home had a high level of stress with poor sleep quality, while less than half of them, with a number of 165 respondents (41.2%) lived in boarding houses/dormitories.

Based on the result from 400 respondents described in (table 2), it is stated that the majority of Padjadjaran University nursing students with smartphone addiction experienced sleep disorders with a number of 399 respondents (99.8%), while a small

proportion of respondents did not experience sleep disorders. The result of this study indicated a higher percentage compared to the research conducted by Petrov et al. (2014) on college students in the United States, with the number of respondents who experienced sleep disorders as much as 36% of the respondents.

The high percentage of respondents who experienced sleep disorders in this study occurred because respondents had matched the criteria for experiencing smartphone addiction. As mentioned in the research conducted by Kaur et al. (2016), electromagnetic radiation and screen light emitted by smartphones can affect melatonin, adrenaline, and cortisol in the body. Melatonin is a hormone that regulates sleep rhythm and causes drowsiness (NINDS 2019), while adrenaline and cortisol are released when the body is in a state of stress resulting from using a smartphone. This condition causes an individual to

sleep not in a calm and relaxed condition (Kaur et al. 2016). The result of this study is in line with the research done by Wang et al. (2019) that stated that there was a relationship between smartphone addiction and sleep disorders experienced by an individual. Efforts that can be made for students who experience sleep disorders are by managing the etiology and guiding college students in overcoming the etiology, one of which is getting used to operate smartphones wisely and being able to approach students interpersonally in order to avoid other trigger factors of sleep disorders and undergo a healthy lifestyle. These efforts can be managed to reduce the incidence of sleep disorders among nursing students at Padjadjaran University.

Based on the results of the data described in (table 3), illustrated that the highest incidence of sleep disorders according to the categories experienced by nursing students at Padjadjaran University who experience smartphone addiction is circadian rhythm sleep-wake disorders with a number of 367 respondents (91.8%). Circadian Rhythm Sleep-Wake Disorder is a change in the circadian endogenous timing system and sleep-wake schedule that is desired and needed (Redeker & McEnany 2011). Signs and symptoms that often occur in college students who experience circadian rhythm sleep-wake disorders are irregular sleep-wake cycles, excessive sleepiness during the day and difficulty sleeping at night, and more sleep during the day than at night (prolonged nap) (Redeker & McEnany 2011). This is in line with research conducted by Petrov et al. (2014) which stated that most college students experience excessive sleepiness during the day. Efforts that can be managed for students who experience circadian rhythm sleep-wake disorders are environmental regulation such as controlling light and dark levels and regulating nap habits (Redeker & McEnany 2011).

Meanwhile, based on the result of research data, the lowest incidence rate of sleep disorders according to the category experienced by nursing students of Padjadjaran University who experience smartphone addiction was obstructive sleep apnea with a number of 123 respondents (30.8%). Obstructive Sleep Apnea is a total or partial blockage of the airway that occurs while an individual is sleeping (Redeker & McEnany 2011). College students who experience OSA usually have signs and symptoms such as drowsiness, fatigue, insomnia, snoring, medical or psychiatric problems, obstruction of breathing, apnea, hypopnea, and extra effort to breathe (Sateia 2014). The result of this study are in line with research conducted by Petrov et al. (2014) which stated

that obstructive sleep apnea (OSA) is a sleep disorder with the lowest incidence among college students. This occurs because there are other risk factors that affect the occurrence of OSA in college students, including an individual's gender and BMI. Explained in the book by Redeker & McEnany (2011) stated that the incidence of OSA is more common in male and in an individual who is overweight. Based on this, the result of this study are in accordance with the theory explained, because the respondents in this study were mostly female with normal weight BMI.

Meanwhile, based on other sleep disorders categories, the majority of respondents also experienced parasomnia with a number of 304 respondents (76%), while less than half of the respondents also experienced insomnia sleep disorders with a number of 185 respondents (46.2%), narcolepsy with a number of 183 respondents (45.8%), and sleep-related movement disorders with a number of 145 respondents (36.2%). Based on all students who experienced sleep disorders, the majority of them had two or more sleep disorders based on their category with a total of 356 respondents (89%). The result of this study indicated that the incidence of respondents experiencing two or more sleep disorders had much higher data than the result of research conducted by Petrov et al. (2014), which stated that of the 36% of respondents who experienced sleep disorders, 6.3% of them experienced two or more sleep disorders. This finding showed that an individual who has smartphone addiction is at high risk of experiencing one or more sleep disorders. Even though it is still unclear whether sleep disorders are caused by overuse of mobile phones or by other reasons since this study did not examine further the relationship of variables, but if we looked into the findings, there were 399 nursing students who experienced smartphone addiction which 356 of them experienced two or more sleep disorders. It may be caused by internet use that affect sleep construction, such as by reducing rapid eye movement (REM) sleep, slow-wave sleep, and sleep efficiency or that the bright light of a computer screen may suppress melatonin secretion and delay the onset of sleep. This finding is in line with a study by Ibrahim, et. al (2018) that showed dependency on mobile phones on medical students was significantly associated with poor sleep quality as measured by subjective sleep quality and a long sleep latency while another study conducted by Sohn et al. (2019) found a clear association between the smartphone's backlight and poor sleep quality.

Since nursing students are prospective health care workers who are prepared to become profes-

sional nurses, it is feared that sleep disorders can cause a negative impact on health services in the future. Promotive, preventive, curative, and rehabilitative efforts are needed to be applied to reduce the incidence of sleep disorders in nursing students of Padjadjaran University.

CONCLUSION

Research conducted on 400 nursing students of Padjadjaran University who experienced smartphone addiction, found that the majority of respondents experienced sleep disorders (99.8%). Majorities experienced a circadian rhythm sleep-wake disorder with a total of 367 respondents (91%) and parasomnia with a total of 304 respondents (76%), while less than half of the respondents experienced insomnia with a total of 185 respondents (46.2%), narcolepsy with a total of 183 respondents (45.8%), sleep-related movement disorders with a total of 145 respondents (36.2%) and obstructive sleep apnea with a total of 123 respondents (30.8%) and 89% had experiencing two or more sleep disorders.

The author recommends a balanced use of smartphones should be adopted, and university faculties should educate students on how to limit smartphone use and protect themselves from smartphone addiction.

This study can be used as a reference and preliminary data for further researchers, especially regarding the sleep disorders in nursing students of Padjadjaran University

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