

## **The Relationship Between Stress Levels and Excessive Daytime Sleepiness in Final Year Students of the Faculty of Nursing, University of Riau**

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### **Abstract**

Final year students are prone to experiencing stress as a result of the pressure or burden they experience. Stressful conditions can cause sleep problems in individuals, one of which is Excessive Daytime Sleepiness. EDS is a feeling of excessive sleepiness during the day. The purpose of this study was to determine the relationship between stress levels and the incidence of Excessive Daytime Sleepiness in final year students of the Faculty of Nursing, University of Riau. This study uses a type of quantitative research with a correlation research design and a cross sectional approach. The study was conducted on 105 respondents, namely final year students at the Faculty of Nursing, University of Riau with a sampling technique using proportional random sampling. The research instrument used a questionnaire sheet. The analysis used was univariate and bivariate analysis using the Pearson Chi Square test. The results of the bivariate statistical test showed that there was a relationship between stress levels and the incidence of Excessive Daytime Sleepiness in final year students of the Faculty of Nursing, University of Riau with a p value of  $0.000 < \alpha (0.05)$ . There is a relationship between stress levels and the incidence of Excessive Daytime Sleepiness in students of the Faculty of Nursing, University of Riau. It is expected that students can control stressful events to avoid Excessive Daytime Sleepiness.

**Keywords:** Excessive Daytime Sleepiness, Final Year Student, Stress Level



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### **INTRODUCTION**

Stress is a physiological change that occurs dynamically and is caused by the body's exposure to harmful pressures as a result of human interaction with its environment. Someone who experiences stress can have an impact on his physical, psychological, social and spiritual (Paula et al., 2021). This shows that stress is a part of human life and every human being can experience stressful events. One group that is very vulnerable to stress is students. The prevalence of students in the world experiencing stressful events is 71% and in Asia it is 61.3% (Habeeb, 2010; Koochaki et al., 2011). Meanwhile, the incidence of stress among students in Indonesia was found to be 71.6% (Ambarwati et al, 2019). In nursing lectures, there are many academic demands that must be carried out and students who are not ready to face all the problems can cause stress (Ambarwati et al., 2019). There is a research by Rosyidah et al (2020) identifying stress events in students of the Nursing Science study program, namely 73% of respondents experienced a high level of stress, while 27% of respondents experienced a moderate level of stress. This shows that nursing students are prone to stress.

Final year students are students who are at the end of their study period. Final year students often experience stress because they have a lot of pressure to face. Tabroni et al (2021) explained that the stressors that often occur in students are academic problems, intrapersonal, interpersonal problems, social relationship problems, self-control and group activities. In addition, stressors are often found in final year students caused by the process of working on their thesis. Research by Aulia & Panjaitan (2019) shows that the majority of stress events in

final year students at the Faculty of Nursing have moderate stress levels as many as 77 respondents (71.3%), severe stress as many as 16 respondents (14.8%), and mild stress as many as 15 respondents (13.9%). Stress can have an impact on a person's physique. One of the physical impacts that occur due to stressful events is sleep disturbance (Musabiq & Karimah, 2018). One of the sleep disorders that can occur due to stress is Excessive Daytime Sleepiness. This statement is supported by research by Kaneita et al (2005) which states that things related to the incidence of EDS are short sleep duration, subjective sleep deprivation, unsatisfied sleep, sleep snoring or dyspnea, and stress.

Excessive Daytime Sleepiness is an event that makes it difficult for a person to wake up during the day. A person experiencing an EDS event may fall asleep unintentionally during daily activities (Turcio et al., 2022). In research conducted by Isac and Abraham (2020) explained that EDS can occur in final year students who experience stress. Stress resulting from an increase in academic load makes final semester students often experience less sleep duration. It is supported by research results which show that 15.4% of students who experience severe EDS have less sleep time. Lack of sleep is the main causal mechanism for EDS (Anwary et al., 2021). In the study of Regina, Bayhakki and Utami (2022), 194 (80.2%) final year nursing students experienced EDS events. This is caused by the use of gadgets at night for more than 60 minutes, which can disrupt student sleep time. This research is supported by a statement explained by the National Sleep Foundation (2011) that the use of gadgets with a duration of more than 1 hour can affect sleep time, short sleep duration and cause sleep problems in individuals.

From the results of a preliminary study conducted on 16 final year students of the A2019 Nursing program UNRI on December 15, 2022 which was carried out by non-formal interview sessions and filling out questionnaires, it was found that 11 students experienced stressful events, namely 5 moderate stress, 4 severe stress, and 2 stress very heavy. From the results of the interviews, it was found that the personal reasons students experienced stress were having personal problems, parental demands, bad peer relations, loneliness, fatigue in working on their thesis because it was difficult to find references, financial problems, as well as information about academic demands related to deadlines for submitting proposals and exam schedules. Based on the description above, researchers are interested in conducting research on the relationship between stress levels and the incidence of Excessive Daytime Sleepiness in final year students of the Faculty of Nursing, University of Riau.

## **RESEARCH METHODS**

This research was carried out at the UNRI Faculty of Nursing starting from January to July 2023. The method in this research was quantitative research with a cross sectional design. The population used is program A 2019 students at the end of the Faculty of Nursing, University of Riau. Sampling using a sampling technique that is Proportional Random Sampling. The number of samples is 105 respondents. How to take samples with the lottery method. The instrument used in this study was a questionnaire sheet. The questionnaire sheet consists of three parts. The first part is data on the characteristics of the respondents in the form of age and gender. The second part is the DASS-42 questionnaire by Lovibond 1995. Researchers used the Indonesian version of DASS-42 translated by Damanik in 2011 which has been tested valid.

Researchers use a stress scale to measure stress levels. Cronbach's alpha value for the stress scale is 0.8806 so that it is confirmed to be valid and reliable (Damanik, 2011). The third part is the Epworth Sleepiness Scale questionnaire. The ESS was developed by Johns in 1991 and is used to measure symptoms of excessive daytime sleepiness (EDS). The researcher used the ESS questionnaire which was translated in Indonesian by Bambangafira in 2017 and had a valid test carried out by 30 nursing students. Obtained  $r \geq 0.361$  and cronbach's alpha with a

value of 0.499 so that it can be said that the ESS questionnaire is valid and reliable (Bambangsafira & Nuraini, 2017). This research consists of two variables, namely the independent variable is the stress level of final students and the dependent variable is the incidence of EDS. Researchers used univariate and bivariate analysis. Bivariate analysis to see the relationship between stress levels and EDS events. The statistical test used is Chi Square. This research has received an ethical certificate from the FKp UNRI Research Ethics Commission with ethical No. 89/UN19.5.1.8/KEPK.FKp/2023.

## RESEARCH RESULTS AND DISCUSSION

**Table 1. Distribution of Respondents Based on Age and Gender Characteristics**

Characteristics	Frequency (f)	Percentage (%)
<b>Age</b>		
a. ≤ 21 year	39	37,1
b. 22 year	56	53,3
c. ≥ 23 year	10	9,6
<b>Gender</b>		
a. Male	11	10,5
b. Female	94	89,5
<b>Total (N)</b>	105	100

The results showed that the results of the study on 105 respondents, the most age category of respondents was 22 years old, namely 56 respondents (53.3%) and the majority of respondents were female, namely 94 respondents (89.5%).

**Table 2. Distribution of Respondents Based on Stress Levels**

Characteristics	Frequency (f)	Percentage (%)
a. Normal	29	27,6
b. Light Stress	26	24,8
c. Moderate Stress	34	32,4
d. Heavy Stress	16	15,2
<b>Total (N)</b>	105	100

The results showed that 26 respondents (24.8%) experienced mild stress, while the most moderately stressed respondents were 34 respondents (32.4%), and 16 respondents (15.2%) experienced severe stress. %).

**Table 3. Distribution of Respondents Based on Excessive Daytime Sleepiness**

Characteristics	Frequency (f)	Percentage (%)
a. Not Experiencing EDS	51	48,6
b. Experiencing EDS	54	51,4
<b>Total (N)</b>	105	100

The results showed that the results of the research conducted on 105 respondents found that 54 respondents (51.4%) experienced Excessive Daytime Sleepiness.

### Relationship between Stress Levels and Excessive Daytime Sleepiness

**Table 4. Distribution of Respondents Based on Excessive Daytime Sleepiness**

Stress Level	EDS Incident	Total	P value
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	Not Experiencing EDS		Experiencing EDS		N	%	
	F	%	F	%			
a. Normal	24	82,8	5	17,2	29	100	
b. Light Stress	13	50	13	50	26	100	
c. Moderate Stress	12	35,3	22	64,7	34	100	0,000
d. Heavy Stress	2	12,5	14	87,5	16	100	
<b>Total (N)</b>	51	48,6	54	51,4	105	100	

The results showed a relationship between stress levels and the incidence of Excessive Daytime Sleepiness in final year students of the Faculty of Nursing, University of Riau. The results of the analysis of the relationship between stress levels and Excessive Daytime Sleepiness found that 22 (64.7%) of the majority of respondents who had moderate stress levels experienced EDS and 14 (87.5%) of respondents who had severe stress levels experienced EDS. The results of the statistical test use the chi square test, in the chi square test the rules used are if the cross tables are more than 2 x 2 then the alternative test used is the Pearson chi square test (Hastono, 2021). In this study the cross table used was a 4 x 2 table, for that the test used was the Pearson chi square test. From the statistical test results, it was found that the p value was  $0.000 < \alpha (0.05)$ , so it can be concluded that  $H_0$  was rejected, which means that there is a relationship between stress levels and the incidence of EDS in final year students at the Faculty of Nursing, University of Riau.

## Discussion

### Age

Based on the research results from the data on the characteristics of respondents according to age, it was found that a total of 105 respondents were in the age range of 21-23 years, where the majority of respondents were at the age of 22 with a total of 56 students (53.3%). According to Elizabeth B. Hurlock, the age range of 21-23 years is the category of early adulthood. Early adulthood is a period of searching for stability and a period filled with problems, emotional tension, periods of social isolation, periods of commitment, periods of dependency, and adjustment to new lifestyles (Jahja, 2011). Final year students of the A 2019 Faculty of Nursing are included in the early adult age category. This research is in line with the results of research by Aulia and Panjaitan (2019) which states that the age of final year students is in the range of 21-23 years, where this age is in the early adult category. Early adulthood is a period of regulation, where individuals begin to have the burden and responsibility to determine future careers and lives. Completing education at tertiary institutions is an obligation for final year students to get provisions for future careers (Aulia & Panjaitan, 2019). The requirement for completing the lecture period and obtaining a bachelor's degree at the Faculty of Nursing, University of Riau is that final year students are required to complete their final assignment (Hamdi, 2022). Final year students are prone to experiencing stressful events. Stress is very common in student life due to the large amount of academic pressure and the need for students to determine academic continuity and prepare for further career plans (Yikealo & Tareke, 2018).

The need for sleep is a basic need for every human being. The need for human sleep depends on the level of development. In the early adulthood stage, sufficient sleep time is needed to be able to carry out activities properly. Individuals who are in early adulthood have a total need of 7-8 hours of sleep per day to obtain sleep satisfaction function (Kozier, Erb, Berman & Synder, 2010). The majority of the early adult group has sleep needs that are not met optimally. This is due to lifestyle factors, both work demands and social activities

(Ratnaningtyas & Fitriani, 2019). Nursing students who are in their final year include a group of young adults who may have a more enthusiastic attitude to prioritize tasks so they have to delay bedtime, lack of sleep duration at night can cause EDS events (Elsa Regina et al., 2022).

### **Gender**

From the results of the study, most of the final year students at the Faculty of Nursing UNRI were female, namely 94 respondents (89.5%). The results of previous research by Maharani, Kurniawan and Hasneli (2023) on students at the Faculty of Nursing UNRI showed that the majority were female, namely 216 respondents (91.1%). This proves that in the Faculty of Nursing UNRI the majority are female. This is supported by Prosen (2022) explaining that women are more considered to have higher caring traits. Nursing students who are female are also better able to understand the conditions being experienced by patients, therefore it is very influential in caring attitudes and nursing actions that are carried out are also more careful.

From the results of the research, most of the respondents were female and this was one of the reasons why women experienced Excessive Daytime Sleepiness. The results of the same study from Meyer et al (2019), namely female individuals showed a higher prevalence of EDS (64.3%) compared to men, showing a prevalence rate of 35.7% ( $p < 0.001$ ). Research by Bambangafira & Nuraini (2017) revealed that women more often experience sleep problems because women are prone to feeling tired and experiencing psychological problems, where fatigue and psychological problems are some of the risk factors for EDS. The brain in women has a negative awareness of conflict and stress, in women conflict triggers negative hormones that cause stress, anxiety, and fear. In other words, when women are under pressure, it is generally easier to experience stress (Louann, 2007).

### **Stress Level**

The results showed that there were 26 respondents who experienced mild stress (24.8%), while the respondents who experienced moderate stress were the most, namely 34 respondents (32.4%), and respondents who experienced severe stress amounted to 16 respondents (15, 2 %). The results of this study are in line with research conducted by Sulana et al (2020) which found that the majority of final year students experienced moderate stress levels totaling 154 respondents (67.5%) and 30 students with severe stress levels (27.9%). This shows that the majority of final year nursing students experience stress and have different levels of stress.

According to the Psychology Foundation of Australia (2010, in Nurhidayat 2021) from the Depression Anxiety Stress Scale 42 (DASS-42) instrument, that is, someone experiencing moderate stress can occur due to disputes between friends, family, and environmental problems. Moderate stress can cause several symptoms including anxiety, irritability, restlessness, feeling tired, being impatient and irritable. This can cause individuals to be hindered in completing an activity. Research by Helpiyani et al (2019) most final year nursing students experienced moderate stress which indicated problems in physical condition, totaling 45 respondents (60%). Respondents complained of irregular sleep causing dizziness, lack of sleep, and eating disorders. While moderate stress on cognitive conditions was found by 46 respondents (51.3%) and complained of difficulty concentrating and forgetting easily.

The results of the study also showed that there were 16 respondents (15.2%) who experienced severe stress. According to the Psychology Foundation of Australia, severe stress occurs due to chronic situations such as endless disputes, economic difficulties, or suffering from chronic illness. This causes a person to find it difficult to think positively, to be tired of doing activities, to feel insecure, and to always think that life is useless. Potter and Perry (2012) explained that students who experience severe stress are caused by inadequate coping

mechanisms and poor time management. The stress experienced by final year students can be caused by several things, one of which is inadequate coping. Students who have good coping with the problems that are happening within them, then they will be able to solve problems without any pressure. In contrast to students who have poor coping, problems cannot be resolved and over time can cause stress (Tasalim & Cahyani, 2021). This is found in the research of Usraleli et al (2020) that final year students who have maladaptive coping experience moderate stress. The results showed that there was a relationship between coping strategies and stress levels in final year students, obtained a p value ( $0.014 \leq 0.05$ ).

Final year students are faced with what is called a final assignment. The final assignment in the form of a thesis is one of the requirements for obtaining a bachelor's degree at the Faculty of Nursing, UNRI. The preparation of final assignments often causes students to experience stress, this is usually caused by hampered communication with supervisors, fear of giving guidance, limited time for lecturers to carry out guidance (Tasalim & Cahyani, 2021). Several other problems that can cause stress in final year students are low motivation, failure in adjustment, financial factors, lack of self-efficacy, bad relationships with friends, worrying too much about future careers, and not good at managing time (Agusmar et al. , 2018).

### **Excessive Daytime Sleepiness**

The results showed that 54 respondents (51.4%) experienced Excessive Daytime Sleepiness. This is in line with Hamdi's research (2022) that final year students at the Faculty of Nursing, University of Riau experienced EDS, namely 65 respondents (54.2%). This shows that final year students are at risk of experiencing Excessive Daytime Sleepiness. The body has certain mechanisms to request that the tissues be rested. This mechanism is known as sleepiness. Based on the circadian rhythm, drowsiness will not increase after the time has passed. A person with a normal circadian rhythm will be able to wake up in the morning, get enough sleep at night, and adjust to sleep patterns as needed. The circadian rhythm cycle can be disrupted if the rhythm shifts (Ambarwati, 2017). Young adults are often found to experience shifts in circadian rhythms due to hormonal changes, resulting in changes in sleep hours. In addition, changes in sleeping hours can occur due to the habit of playing gadgets before going to bed, accessing social networks, difficulty sleeping, and the habit of doing tasks late at night, causing individuals to experience sleep deprivation (Purnawidani & Sali, 2020). Someone who lacks sleep can be at risk of experiencing EDS.

Anwary et al (2021) stated that the main mechanism of EDS is sleep deprivation. Research by Seravine and Prastowo (2019) students who experienced EDS had less sleep duration, totaling 41 respondents (79%). From the statistical test results, it was obtained that the value of  $p = 0.020$ , which means that there is a significant relationship between sleep duration and the incidence of EDS in students. In Isac & Abraham's research (2020) also stated that final year students who experienced the most EDS incidents were individuals who had a sleep duration of 4-6 hours/day compared to sleep duration of more than 6 hours/day. Deprivation of sleep from the body's needs can cause the body to respond to compensate by causing excessive sleepiness. One of the factors that causes Excessive Daytime Sleepiness is stress. In line with the incidence of EDS in this study where stressed final year students also experienced excessive sleepiness during the day. Potolicchio (2003, in Rachmawati, 2013) someone who is facing things that make him stressed or depressed, can cause excessive sleepiness so that it can make them fall asleep accidentally when they are active. In addition, excessive use of gadgets at night can also cause EDS problems in students. This is found in the research of Regina, Bayhakki and Utami (2022) that as many as 193 people (79.8%) had a duration of using gadgets at night that was more or equal to 60 minutes and as many as 194 people (80.2%) students experienced EDS. The National Sleep Foundation (2011) explains that the use of gadgets with a duration of

more than 1 hour is said to affect sleep time, short sleep duration and cause sleep problems in individuals.

### **The Relationship between Stress Levels and Excessive Daytime Sleepiness in Final Year Students of the Faculty of Nursing, UNRI**

The results of the analysis of the relationship between stress levels and Excessive Daytime Sleepiness found that 22 (64.7%) of the majority of respondents who had moderate stress levels experienced EDS and 14 (87.5%) of respondents who had severe stress levels experienced EDS. The statistical test results showed a p value of  $0.000 < \alpha (0.05)$ , so it can be concluded that  $H_0$  was rejected, which means there is a relationship between stress levels and the incidence of EDS in final year students at the Faculty of Nursing, University of Riau. This study is in line with the study of Kaneita et al (2005), which shows a strong relationship between stress and excessive sleepiness during the day. This study proves that psychological or psychiatric disorders can be a factor underlying the occurrence of Excessive Daytime Sleepiness in the Japanese population.

Stress can have physical, psychological, social and spiritual impacts (Paula et al., 2021). One of the physical impacts that occur as a result of stressful events is sleep disturbance. Stressful conditions can cause disturbances in sleep frequency. This is caused by an increase in norepinephrine in the blood through the sympathetic nerves. This substance may disrupt stage IV NREM and REM sleep. Individuals whose minds are filled with problems will not be able to relax to fall asleep (Kozier et al., 2016). Research on final year students of the Faculty of Nursing found that most of the respondents experienced moderate stress which indicated problems in physical condition totaling 45 respondents (60%). Respondents complained of irregular sleep causing dizziness and sleep deprivation (Helpiyani et al., 2019). In Potter and Perry (2020) prolonged stress can cause bad sleeping habits. In times of stress, individuals try hard to fall asleep and frequently wake up during sleep cycles. This can lead to sleep deprivation problems at night.

Short sleep duration is the primary cause of Excessive Daytime Sleepiness (Anwary et al., 2021). Excessive drowsiness can be transient when a person is experiencing things that cause him stress or depression (Rachmawati, 2013). Physical and psychological stress can trigger hyperactivity on the HPA Axis. This can stimulate the hypothalamus to immediately release Corticotropin Releasing Factor into the blood vessels, so that cortisol levels in the blood increase. Continuously high levels of cortisol will increase the frequency of wakefulness, increase the EEG frequency during the sleep phase, and decrease short sleep waves. This can result in reduced sleep hours at night so that during daytime activities you experience excessive sleepiness or EDS (Ahmad et al., 2022).

In a study by Meyer et al (2019) verified factors related to the incidence of EDS in Brazilian adolescents. The results of the analysis were female, low stress control, and short sleep duration. Low stress control was found to be closely related to excessive sleepiness during the day. This was confirmed by an experiment conducted by Vgontzas et al (2005, in Meyer et al., 2019), namely an increase in the peak of pleiotropic cytokines IL-6 and also a decrease in the level of cortisol secretion in someone who experiences excessive sleepiness during the day.

### **CONCLUSION**

This study aims to determine the relationship between stress levels and the incidence of Excessive Daytime Sleepiness in final year students of the Faculty of Nursing, University of Riau. From the statistical test results, it was found that the p value was  $0.000 < \alpha (0.05)$ , so it can be concluded that  $H_0$  was rejected, which means that there is a relationship between stress levels and the incidence of EDS in final year students of the Faculty of Nursing, University of Riau. The

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