

Correlation between Stress before Exam and Passing Block Exam Results at Preclinical Students of Medical Faculty, University Nusa Cendana

Stefearly Figo Ferguson¹, Elisabeth Levina Sari Setianingrum², Ika Febianti Buntoro³, Dyah Gita Rambu Kareri⁴

ABSTRACT

Introduction: Stress in medical students is prone to occur because lot of stressors happened. Problem Based Learning system requires students to adapt to student central learning. Inability to adapt cause stress. Cortisol has an impact on difficulty concentrating, digestive disorders, psychology and difficulty focusing in learning. Student that can't fully performance will affecting their exam results. Aims: To analyze the correlation between stress before exam and passing block exam results at preclinic students of University Nusa Cendana Medical Faculty. Settings and Design: Observasional Analytic with Cross Sectional design

Material and methods: Sampling was carried out using the stratified random method and obtained 144 respondents from batch 2018, 2019 and 2020. Data were taken using the Medical Student Stressor Questionnaire (MSSQ) and block exam results on academics. Statistical analysis used: Data analyzed by Chi Square Test with statistics SPSS 25.

Results: 144 respondents, with mild 3 respondents, 29 respondents moderate and 112 respondents severe level. Passing the exam results obtained 3 respondents did not pass and 141 respondents pass. Chi Square test analysis obtained the p value = 0.646 ($p > 0.05$).

Conclusions: There is no statistical correlation between stress before exam and block exam result in preclinical students of Medical Faculty, Nusa Cendana University.

Keywords: Stress, Block Exam, Preclinical, University Nusa Cendana, Medical Faculty

teaching-learning relationships, and 39,9% for desire and control.¹ According to research conducted by Nasution (2018) research on the association between stress symptoms and block result of first-year students of Medical Faculty, University of Muhammadiyah North Sumatra, 32 students do not experience the stressor.⁵

The "Problem Based Learning" (PBL) is a learning system, that use block system process of learning, begins with a problem that needs to be fixed. This process requires students critical and participation in problem-solving.⁶ Students that inability to adapt will having stress, which will have impact on learning and educational achievement.^{4,5} The block system is broken down into a variety of activities, including small group discussion, practicum, assignments, and final block exam. The student of 2018 (Public Health, Forensics, and Emergency) got an average of 85 student passed and 1 did fail, The 2019 class (Cardiovascular, Respiration, and Special Senses) got an average of 48 student passed and 6 failures, while the 2020 class (Biomedicine 2, Base of Therapeutic, Immunhemato) had such an average of 54 passes and 26 didn't pass.

Previous study from Andalas Medical Faculty Class of 2016 conducted by Ananda (2018) about stress susceptibility and academic accomplishment discovered there is substantial correlation between stress and academic achievement, but other finding research by Nasution (2018) about Stress symptom and block result found there is no significant correlation.^{7,5} Based on the preceding description, the researcher wishes to see if there is a correlation between stress and block exam result.

MATERIAL AND METHODS

Study Design and Setting

This is an analytic observational study with a cross-sectional design. This research was conducted exclusively online,

¹Student of Medical Faculty, University Nusa Cendana, ²Head of Preclinic Medical Faculty, University Nusa Cendana, ³Head of Profession Education Medical Faculty, University Nusa Cendana, ⁴Lecturer of Medical Faculty, University Nusa Cendana

Corresponding author: Stefearly Figo Ferguson, St. HTI No.2, District Maulafa, City of Kupang, Capital of Nusa Tenggara Timur

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INTRODUCTION

Stress is an emotional feeling that arises from body-soul imbalance. The imbalance happen because events and experienced that occur around humans will delivered stress.¹ Global prevalence of student with stress ranged from 38-71%, in Asian there are 39,6-61,3%, in Indonesia there are 36,7-71,6%.⁴ research that conducted by Tuto (2019) at Medical Faculty of University Nusa Cendana, compiled from 100 participants, 30 of whom did not suffer stress and 70 students having stress. This happened because there is transition phase from childhood to adulthood during the time, affecting process of reproductive, psychological, emotional, and intellectual maturation.^{2,3}

Research from Rahmayani (2019) about stress levels in first-year medical students in medical professional study program at Medical Faculty of Andalas University batch 2017 common stressor upto 53,2% for social relationships, 51,6% for academics, 45,2% for group activity stress, 42,6% for intrapersonal and interpersonal relationships, 42% for

using Zoom Meeting, Whatsapp Video Call, and Google Docs. This study located at University of Nusa Cendana's Medical Faculty from 4th October to 16th November.

Study Participants and Sampling

Total population from batch 2018, 2019 and 2020 are 226 students. Stratified random sampling is chosen to be the sampling technique and to determine the total sampling using Taro Yamane pattern.

$$n = \frac{N}{n \cdot d^2 + 1}$$

n = total sampling.

N = total population.

d = precision of wrong 5% (0.05).

After the total number of sampel has found (144 sampel), researcher distribute them to 3 batches (2018, 2019 and 2020).

$$n_i = \frac{N_i}{N} \times n$$

n_i = number of sampel each stratified.

N_i = number of population each stratified.

Final sampel distribution researcher found sampel allocation for batch 2018 there are 54 students, batch 2019 there are 39 students and batch 2020 there are 51 sampel respondents.

Data Tool and Collection

There are 2 types of data that will be present in this study. The first is primary data conducted from Medical Student Stressor Questionnaire (MSSQ) and secondary data that conducted from academic staff of Medical Faculty of Nusa Cendana University. The Medical Student Stressor Questionnaire (MSSQ) will be used to assess student stress levels, in this study and for the final block result exam the data will be collecting and using from academic staff.

Before the questionnaire given to sampel first of all the sampel should choose whether agree to join in this study or not by filling the inform consent form and then they will be filter by inclusion and exclusion criteria. After that data were collecting by the Questionnaire will be spread a week before final block exam to each batch in different day. Each batch will be spread to small group to help the research while in explanation the purpose of this study and how to fill the questionnaire. During the questionnaire fill time researcher always with the respondents in room zoom or whatsapp video call until each member of the batch sample complete to fill it up. After the final block exam finished, researcher pose the permit letter to have the final exam results as the second data in this study.

Data from Medical Student Stressor Questionnaire (MSSQ) and block exam result going to analyzed by using the SPSS computer program statistic 25. Data were analyzed by univariately, using the frequency of every single variable (stress before exams and block exam results), and then bivariate using the chi-square test. The stress before the exam is the independent variable and dependent variable is passing the block exam results.

Ethical consideration

This study is a part of bachelor degree that approved with Ethics Code: UN01210886 at Medical Faculty of Nusa Cendana University. The ethical committee approved by Dr.dr Idawati Trisno, M.Kes as the chief of ethical board. Along before the study begin all participants provided with informed consent that says they were willingly to join in this study. Participants were aware about the benefit in this study with no till minimal detriment on participant.

RESULTS

Data from the characteristics of respondents according to table 1 shows that there are 2 (1.4%) respondents aged 17 years, there are 18(12.5%) 18 years old respondents, there are 45(31.3%) 19 years old respondents, there are 41(28.5%) 20 years old respondents, there are 34(23.6%) 21 years old respondents, there are 3(2.1%) 22 years old respondents and

No	Age	Frequency (n)	Percentage (%)
1	17 years	2	1.4%
2	18 years	18	12.5%
3	19 years	45	31.3%
4	20 years	41	28.5%
5	21 years	34	23.6%
6	22 years	3	2.1%
7	23 years	1	0.7%
	Total	144	100.0%

Table-1: Characteristics of Respondents

No		Frequency (n)	Percentage (%)
1	Boys	41	28.5%
2	Girls	103	71.5%
	Total	144	100.0%

Table-2: Characteristics Respondent based on Gender

No	Batch	Frequency (n)	Percentage (%)
1	2018	54	37.5%
2	2019	39	27.1%
3	2020	51	35.4%
	Total	144	100.0%

Table-3: Characteristics Respondents based on Batch

No	Level of Stress	Frequency (n)	Percentage (%)
1	Mild	3	2.1%
2	Moderate	29	20.1%
3	Severe	112	77.8%
	Total	144	100.0%

Table-4: Distribution of Stress Levels in Respondents

No	Exam Passing Result	Frequency (n)	Percentage (%)
1	Didn't Pass	3	2.1%
2	Pass	141	97.9%
	Total	144	100%

Table-5: Distribution of passing result Exam on Respondents

No	Stress level	Block Exam Result		Total	p value
		Pass	Didn't Pass		
1	Mild (%)	3 (2,13%)	0 (0%)	3 (2,08%)	0,646*
2	Moderate (%)	29 (20,57%)	0 (0%)	29 (20,1%)	
3	Severe (%)	109 (77,3%)	3 (100%)	112 (77,78%)	
	Total	141 (100%)	3 (100%)	144 (100%)	
*p > 0,05 Chi Square					

Table-6: Stress Bivariate Analysis Results and Exam Pass Results

there is 1(0.7%) 23 years old respondents. Respondents with the most age were 19 years old, and the number of respondents with the least age being 23 years old. Respondents with the oldest age, aged 23 years and the youngest age 17 years.

Result data in Table 2, the characteristics of respondents based on gender were obtained from 144 respondents. The research found that female respondents, totaling 103(71.5%) were the largest respondents compared to male sex, which amounted to 41(28.5%) people. This is because the proportion of female students in each batch has a higher proportion.

Based on Table 3, it shows that the research respondents consisted of the 2018 2019 and 2020 classes with a total of 144 respondents. The most respondents were in the 2018 class, namely 54(37.5%) respondents, the 2019 class, which was 39(27.1%) respondents and the 2020 class, which was 51(35.4%). This is supported by the highest number of students coming from the 2018 batch, which is 86 students, while the 2019 batch of respondents is the batch with the least number of 39(27.1%) people, this is supported by the total number of students from the 2019 batch as many as 60 people.

Based on table 4 explains that there are 3(2.1%) respondents experienced mild stress, 29(20.1%) respondents experienced moderate stress, and as many as 112(77.8%) respondents experienced severe stress. In this study, the level of stress experienced by most respondents was severe stress with a percentage of more than half of the research respondents

Based on Table 5 shows that as many as 141 (97.9%) of respondents passed and 3 (2.1%) of respondents did not pass. Based on table 6 describe that students with mild stress levels there are 3(2.13%) respondents who passed the block exam, Students with moderate stress levels there are 29(20.57%) respondents who passed the block exam and students with severe stress levels are the most stressful levels experienced by preclinical students before the exam, there are 112(77.78%) respondents, with 109 (97.32%) respondents who passed the block exam and 3(2, 68%) who did not pass the block exam. respondents.

The results of the analysis with *Chi-Square* test $p = 0.646$, which means that there is no statistically significant correlation between stress before exam and passing of the block exam results at preclinic students of Medical Faculty, University Nusa Cendana

DISCUSSION

These findings are consistent with studies conducted by Nasution (2018) on the relationship between stress symptoms and block scores in students at the University

of Muhammadiyah North Sumatra's Medical Faculty, Abdulghani (2011) on stress and its effects on medical students, and Alsalhi (2018) on the relationship between stress and academic achievement. The results of this analysis showed that there was no relationship between stress and test results. This could be because the stress experienced was acute, and students had stress distribution coping mechanisms, so it had no significant impact on their scores.^{5,8,9} Different results were obtained in research conducted by Ranasinghe (2017) on emotional intelligence, perceived stress, and academic performance in Sri Lanka as well as a systematic review by Ahmady (2021) regarding the relationship between stress, time management, and academic achievement in preclinical medical education.^{10,11} There is a correlation between stress levels and academic outcomes. This is attributable to the fact that when the stress keep ongoing it will induce an increase in the production of the hormone cortisol, that bring impact by resulting in physical symptoms such as, insomnia, Tachycardia, difficult to breath, diarrhea, , difficult to concentrate, memory loss, poor sociability with friends and family that can interfering with students' ability to prepare for the test.¹²

Melaku (2015) explained in his research on stress among medical students and academic performance that, in addition to intrinsic factors, Extrinsic factors also play an important role in determining the passing of student exam results, such as whether the learning environment by students is adequate, the qualifications and experience of the teaching staff, supervision during exams, friends and study groups to the concern and timing of students towards their learning.^{13,14} Stress factors and coping mechanisms of students have a role in the relationship between stress and passing block exam results. Students who will face exams are very vulnerable to experiencing stress. Types of stress that can affect students in preparing themselves can be divided into two, namely chronic stress (distress) and acute stress (*eustress*).^{15,16} Chronic stress is stress experienced within a period of several weeks to several months and can even be persistent. Chronic stress can cause changes at the structural level of the body, namely widening of the amygdala and shrinking of dendritic cells in the *prefrontal cortex* which has an impact on increasing the static hormone cortisol so that the emergence of symptoms of anxiety, stress and cognitive impairment can affect test results, while the time of data collection of the respondents, that's a week before the block exam was carried out, referred more to acute stress events. Acute stress is associated with physiological changes that cause stress mechanisms such as *fight or flight*, *being brave* in facing challenges, and taking

risks. In this situation, the hormone cortisol will increase as long as the trigger mechanism remains, in this case, students will face exams, as a trigger for stress, so that as a student respond in dealing with stressors, students will be more active in studying and preparing themselves.¹⁷ The impact of stress can be minimized by having a good coping mechanism so that it allows students to achieve good results. Coping is a way/activity carried out by students to be able to reduce, control, and eliminate the stressors. There are 2 type of coping that is Coping focuses on the problem more emphasizing on managing the problems faced both from outside and from within which are considered to have disturbed the balance of mental pressure that can be borne by the student, in this case, students who will face exams due to the large amount of material that must be studied, students will start to study the material. slowly both individually and by using online media for group study and coping that focuses on emotional control emphasizes the determination of students not to express their emotions directly, but focuses on controlling the emotions they feel so that the problems faced will not cause excessive feelings, such as in dealing with the nervousness and anxiety faced before the exam, most students will do their favorite hobbies or visit places that are their favorite places to be with other friends, so Not students will be calmer in preparing for the exam.^{18,19}

Beside the coping mechanism, there still several factor that can influence in this study like learning style, motivation, study duration, and supervision during the exam. Students who know the learning styles and strategies that suit to themselves make it possible to understand the material more effectively and efficiently than students who do not know their learning styles and strategies.^{20,21,22} High motivation is an impetus for students to achieve the target, in this case, students have the motivation not to repeat the block so that they study hard for the exams they will face, besides that they also get from the goals to be achieved, the student social environment to the support and desire to make parents proud.^{23,24} The high academic demands cause students to vulnerable to got depression.²⁵ The demand to have to study a lot of material that is not obtained during class learning, make students spends more time on studying material, the more knowledge they understand so that when facing exams students will be calmer about it.²⁶ An external factor that plays a role is the supervisory mechanism during the exam. The change in the monitoring mechanism from *on-site* to online is due to the ongoing Covid-19 pandemic.²⁸ Examination supervision is *On-site* carried out in a room that has been cleaned and specially prepared by the supervisory lecturer so that only the student concerned is allowed to enter the examination room, in contrast to the online supervision mechanism, because the supervisor can only see from the point of view of the camera *smartphone* so that the area is narrow. From the point of view of the exam supervisor, it can create opportunities for students to cheat, which causes the scores of some students to reach the target of passing the block exam.

Acute stress in a short time can have a positive influence on

the academic field because it will spur students to complete activities they started such as trying to complete learning to prepare for exams. The body is exposed to stress for a long period, the body will begin to adapt to exposure to high stress, resulting in changes in the structural level of the body which causes symptoms of difficulty in controlling emotions and feelings, headaches to difficulty in remembering things, therefore before stress reaches a dangerous level, it is necessary to know the danger signs, such as shaking, difficulty concentrating until you can feel depressed and difficult to control emotions that have occurred over days to weeks when these symptoms have been experienced it is better if you see someone who understands the field better such as psychiatrists and psychologists to be able to prevent and treat the symptoms of stress experienced.^{17,27}

Limitation and Recommendation

The author In this study realize that, our study can be upscale by doing the whole intervention kind of learning in problem based learning model block system, having short examination to have better view kind of stress that student experianced and looking for other instrument that focusing the stress symptom to minimalize refraction between acute and chronic stress. Further studies are needed to see clearly about effect of each kind of stress.

CONCLUSION

Based on the finding of this study, we can conclude that there are lot of students that experience severe level of stress and pass the block exam. This can be happened because refer to data that has been collect, mostly kind of stress that they experience are acute stress (refer to time of questionnaire were spread) that can be solve by right coping mechanism and collecting support system, motivation and upscaling duration of learning.

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