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Research Article

The Relationship between Anxiety Level and Cognitive Function of Students Class of 2022 Medical Faculty of Universitas Palangka Raya in Dealing with OSCE

Hubungan Tingkat Kecemasan terhadap Fungsi Kognitif Mahasiswa Angkatan 2022 Fakultas Kedokteran Universitas Palangka Raya dalam menghadapi OSCE

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Abstract

Anxiety is a feeling that is often felt in dealing with various life situations that occur to a person. This can also happen to new students taking the Objective Structured Clinical Examination (OSCE). Anxiety that is continuously experienced by students will disrupt their sleep patterns, and lack of sleep results in poor sleep quality which can affect the cognitive and psychomotor aspects of medical students. This study aims to determine the relationship between anxiety levels and students' cognitive function in dealing with OSCE. This research is a cross-sectional study, where the research subjects are students from the class of 2022 who meet the exclusion and inclusion criteria. The research was conducted in June 2023 at the Faculty of Medicine, University of Palangka Raya. This research was conducted on 135 subjects consisting of 41 men and 94 women with an average age of 19(17-21) years. The highest anxiety level before the OSCE exam in the study was a moderate anxiety level of 75.5%. There is no significant relationship between anxiety level (ZSAS score) and cognitive function (Moca-Ina) with p=0.680. In conclusion, there is no relationship between anxiety level and students' cognitive function in dealing with OSCE.

Keywords*: anxiety; cognitive function; student; objective structure clinical examination*

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Abstrak

Kecemasan merupakan perasaan yang sering dirasakan dalam menghadapi berbagai situasi kehidupan yang terjadi pada diri seseorang. Hal ini juga dapat terjadi pada mahasiswa baru yang akan mengikuti *Objective Structured Clinical Examination* (OSCE). Kecemasan yang terus menerus dialami oleh mahasiswa akan mengganggu pola tidurnya, kurang tidur mengakibatkan kualitas tidur yang buruk yang dapat mempengaruhi aspek kognitif dan psikomotorik mahasiswa kedokteran. Penelitian ini bertujuan untuk mengetahui hubungan antara tingkat kecemasan dengan fungsi kognitif mahasiswa dalam menghadapi OSCE. Penelitian ini merupakan penelitian cross-sectional, dimana subjek penelitian adalah mahasiswa angkatan 2022 yang memenuhi kriteria eksklusi dan inklusi. Penelitian dilakukan pada bulan Juni 2023 di Fakultas Kedokteran Universitas Palangka Raya. Penelitian ini dilakukan pada 135 subjek yang terdiri dari 41 laki-laki dan 94 perempuan dengan usia rata-rata 19 (17-21) tahun. Tingkat kecemasan tertinggi sebelum ujian OSCE pada penelitian ini adalah tingkat kecemasan sedang sebesar 75,5%. Tidak terdapat hubungan yang signifikan antara tingkat kecemasan (skor ZSAS) dengan fungsi kognitif (Moca-Ina) dengan nilai p=0,680. Kesimpulannya, tidak ada hubungan antara tingkat kecemasan dengan fungsi kognitif mahasiswa dalam menghadapi OSCE.

Kata kunci: kecemasan; fungsi kognitif; mahasiswa; *objective structure clinical examination*

Introduction

Anxiety is a feeling that is often felt in dealing with various life situations that occur to a person when facing a situation or problem that is considered difficult or impossible.[1] According to the 2013 Basic Health Research, 6% of Indonesia's population suffers from anxiety and depression at a significant level.[2] Several factors that can cause anxiety when facing Objective Structured Clinical Examination (OSCE) include lack of preparation, fear of failure, and pressure from limited time.[3] This anxiety can hinder cognitive function which affects performance on exams.[4]

Several studies report that between 43 -88% of medical students have poor sleep quality due to prolonged stress and anxiety due to an extensive educational curriculum.[5] This is caused by high learning intensity, many assignments that must be submitted shortly, busy schedules, large amounts of material, module exams, and heavy responsibility to pass each exam.[6] The usual tests are in the form of Multiple Choice Question (MCQ) exams and skill tests in the form of OSCE.[3] Constant anxiety continuously experienced by students will disrupt their sleep patterns, lack of sleep results in poor sleep quality which can affect the cognitive and psychomotor of medical students.

Anxiety affects cognitive function in elderly people, this is associated with abnormalities in the anatomical structure of the brain and neurotransmitter imbalances.[8] Cognitive functions, which are mental processes of receiving, using, and preserving information, may be classified into domains such as attention, perception or memory, problem-solving, reasoning, or planning.[9] Cognitive function is a broad terminology of the mental processes that involve the acquisition of

knowledge, manipulation of information and reasoning. The domain of cognitive function consists of perception, memory, learning, attention, decision-making, and language skills.[10] According to research by Mancevska, medical students in the first semester have a high level of anxiety.[11] Students often experience anticipatory anxiety prior to learning, fears of negative evaluation within the classroom, physiological indicators of anxiety (i.e., quaky voice, blanking mind), self-consciousness, embarrassment during learning activities, and rumination. [12] Students of the Faculty of Medicine in the first year who experience anxiety in Pakistan 45.86% and in Indonesia 45%.[13]

The explanation above shows the risk of cognitive dysfunction in FK students and the high level of anxiety, especially in first-year FK students. This also happens for students who are participating in OSCE for the first time, because OSCE is still a new thing. Therefore, this study aims to determine the relationship between anxiety levels and cognitive function in the face of the OSCE in class 2022 students of the Faculty of Medicine, University of Palangka Raya.

Methods

This research is an observational analytic study with a cross-sectional research design with primary data sources taken consecutively from all students of the Faculty of Medicine, University of Palngka Raya, class of 2022. The study was carried out after being approved by the Health Sector Research Ethics Committee, Faculty of Medicine, Palangka Raya University. Subjects who took part in the study were 135 subjects. The inclusion criteria is a class of 2022 students of the Faculty of Medicine, University of Palangka Raya who are willing to participate in research, by signing informed consent. The exclusion criteria were students from batch 2022 at the Faculty of Medicine, University of Palangka Raya who previously had a history of psychiatric disorders. The research subjects were then examined for anxiety levels with a *Zung Self-Rating Anxiety Scale (ZSAS)* score. The Indonesian version of the ZSAS questionnaire has been tested for validity and reliability by Anggi Setyowati (2019), the value r = 0.043–0.530, $p < 0.05$, which means the Indonesian version of the SAS/ZRAS questionnaire is valid. [14] The results of the validity of the Moca-Ina value are r = 0.529 and p = 0.046, thus the Moca-Ina instrument is declared valid using for cognitive examination of post-stroke patients in the recovery phase.[15] This study protocol was approved by the Health Medical Research Ethics Committee of the Faculty of Medicine, University of Palangka Raya (Palangka Raya, Indonesia) with registration number 33/UN.24.9/LL/2023

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Results

The demographic characteristics of the 135 subjects studied were found to be gender, consisting of 41 subjects (30.4%) male and 94 female subjects (69.6%) (table 1). Descriptive data related to age show that the median age is 19 years with the lowest age being 17 years and the highest being 21 years.

Descriptive analysis shows that the average ZSAS score is at a median of 39 with a minimum value of 20 and a maximum value of 68. On the average Moca-Ina score, a median value of 26 is obtained with a minimum value of 17 and a maximum value of 30. The highest level of anxiety is moderate anxiety with a percentage of 75.5 % and the lowest level of anxiety is light anxiety at 0.8%. Descriptive data for each cognitive domain were also assessed for the average, namely: the mean value of the viso-spatial domain was 5 (1-5), the naming domain was 3(1-3), the attentional domain was 5(2-6), the language domain was 3 (0-3), the domain abstraction 2 (0-2), delayed recall domain 4 (0-5), and orientation domain 6 (5-6). Patient descriptive analysis can be seen in table 1.

Table 2 shows the relationship between the level of anxiety on students' cognitive function in facing OSCE. Bivariate analysis using the Spearman test showed insignificant results. There is no significant relationship between anxiety and students' cognitive function in dealing with OSCE p-value = 0.680.

Table 1 Characteristics of Research Subjects

Characteristics of Respondents	Average	n (135)	Percentage (%)
Gender			
• Man		41	30,4
• Woman		94	69,6
Age (years)	19(17-21)*		
ZSAS score	39(20-68)*		
Moca-Ina score	26(17-30)*		
Degree of Anxiety			
• Mild Anxiety		1	0.8
• Moderate Anxiety		102	75.5
• Severe Anxiety		26	19,3
• Panic Anxiety		6	4,4
Cognitive Domains			
• Visuospatial	5(1-5)*		
• Naming	3(1-3)*		
• Attention	5(2-6)*		
• Language	3(0-3)*		
• Abstraction	2(0-2)*		
• Delayed Recall	4(0-5)*		
• Orientation	6(5-6)*		

*Data is not normally distributed

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Table 3 shows the relationship between anxiety levels and each domain of cognitive function. Bivariate analysis using the Spearman test showed insignificant results. There is no significant relationship between anxiety levels and each domain of cognitive function scoresp value in the visuospaisal domain p=0.843, naming domain p=0.958, attention dominance p=0.342, language dominance p=0.740, abstraction dominance p=0.884, delayed recall domain p=0.902, and orientation domain p=0.938.

Table 2 The Relationship between The Level of Anxiety on Students' Cognitive Function before OSCE

	ZSAZ score
Moca-Ina score	r=0.036 p=0.680 n=135

Spearman correlation test

Table 3 Relationship between Anxiety Level and Cognitive Domain

	ZSAZ score
Visuospatial	r=0.017 p=0.843 n=135
Naming	r=-0.005 p=0.958 n=135
Attention	r=-0.082 p=0.342 n=135
Language	r=-0.029 p=0.740 n=135
Abstraction	r=-0.013 p=0.884 n=135
Delayer Recall	r=-0.011 p=0.902 n=135
Orientation	r=-0.007 p=0.938 n=135

Spearman Correlation Test

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Discussion

In this study, there were more women than men, namely 69.9%. This is relevant to research conducted with demographic characteristics of 52% of female adolescents. Based on this study, women experience more anxiety than men.[16] The average age is in the median of 19 years old, teenagers often experience anxiety, this is related to their rapid growth, and they believe that no one understands them.[14] Human sex steroid levels change dramatically, which mediates increased basal and stress-induced activity in the HPA axis. The axis will produce glucocorticoids, excessive glucocorticoid production will affect hippocampal development, which also affects the emergence of anxiety in adolescents and young adults.[17]

The highest anxiety level before the OSCE exam in the study was a moderate anxiety level of 75.5%. Anxiety before exams is a physiological phenomenon and a behavioral response that has both positive and negative effects on students. The positive effect is that students will prepare well for exams.[18] Medical students as students are also inseparable from exams. The tests that are usually faced are in the form of Multiple Choice Questions (MCQ) and skills tests in the form of Objective Structured Clinical Examination (*OSCE*).[19] This anxiety occurs due to the fear of failing in the *OSCE*, so the *OSCE* exam is one of the stressors that triggers emerged of anxiety.[20]

The relationship between anxiety level and cognitive function was not significant in this study. Cognitive function affects poor concentration and memory which will affect *OSCE* graduation. There were no significant results between anxiety levels and gender, age, and online and offline *OSCE* graduation.[21] There is no significant relationship between the level of anxiety in facing *OSCE* and *OSCE* graduation in Unand FK students with a value of $p = 0.461$ and $r = -0.016$.[4] However, the results of a meta-analysis showed things that were not relevant to this study, increased social anxiety was associated with lower social cognitive ability.[22]

Anxiety activates the endocrine system. The hypothalamus that receives a stress stimulus will stimulate the anterior hypothalamus to secrete corticotropin-releasing hormone (CRH), this hormone will stimulate the anterior pituitary to secrete Adrenocorticotropin Hormone (ACTH). This hormone will activate the anterior cortex fasciculate zone to secrete the hormone cortisol. This hormone plays a role in a negative feedback process that will be delivered to the hypothalamus and forwarded to the amygdala to strengthen the influence of anxiety on one's emotions.[23] The hormone cortisol affects electrophysiology and decreases the excitability of neurons in the hippocampus due to an increase in calcium ions in the cytoplasm. This will cause damage to the hippocampus, it related to cognitive impairment.[24]

Fayegh et all (2010) also showed a significant correlation ($r= -0.23$, $p=.000$) between

test anxiety and academic achievement among adolescents.[25] This is certainly not relevant to this study because the most common anxiety encountered when facing OSCE is anxiety medium, it is said that it is severe anxiety that affects the level of motivation and academic achievement. [18] In addition, anxiety itself can be a source of positive motivation and energy when a person knows how to overcome it so that it has an impact on success in overcoming a problem.[25.] Research conducted by Nyeberg et all which shows anxiety performed significantly lower on the block design digit span forward, digit span sequencing and matrix reasoning test.[26] The relationship between anxiety and cognitive function in heart failure patients also shows there is interference in the cognitive domain, namely in the domain of recall memory.[27] Anxiety also affects cognitive impairment in the memory domain in Parkinson's patients.[28] However, in this study, the subjects studied were healthy subjects without comorbidities. A recent review reviewed anxiety and working memory as a cognitive domain. Not all anxiety affects working memory as a cognitive domain. Not all anxiety affects working memory.[29] The differences in the results of this study are interesting for further research

Conclusion

There is no correlation between anxiety levels and the cognitive performance of students during an OSCE in this study.

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