# Relationship between Anxiety Levels and Cumulative Achievement Index in Students of the Faculty of Medicine, University of North Sumatera

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A R T I C L E I N F O

A B S T R A C T

Anxiety is an emotion characterized by feelings of tension, worrying thoughts and causes physical changes. Medical Faculty students tend to experience anxiety. Several factors such as influences from gender roles, family and culture, self-recognition and achievements have an effect on academic achievement. This study aims to determine the relationship between level of anxiety and grade point average in Faculty of Medicine students, Universitas Sumatera Utara. This research is an observational analytical study with a cross-sectional design which was conducted on preclinical students at the Faculty of Medicine, Universitas Sumatera Utara by filling out the Zung Self-rating Anxiety Scale (ZSAS) questionnaire. The results showed that 53.4% students had normal anxiety, 33% with mild anxiety, 8% had moderate anxiety, and 5.7% in severe. Majority of students with normal and mild anxiety levels have higher GPAs compared to those with severe anxiety levels being in the lower GPA category. Based on the bivariate analysis test, with having the result that p = 0.001 (p<0.05) shows a significant association between anxiety levels and the cumulative GPA. There is a relationship between level of anxiety and the cumulative grade point average for students in the Faculty of Medicine, Universitas Sumatera Utara.

**INTRODUCTION**

Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes such as increased blood pressure. People with anxiety disorders usually have recurring, intrusive thoughts or worries (American Psychological Association, 2022). Anxiety becomes a problem when it cannot be resolved and appears suddenly (Christianto et al., 2020).

Anxiety is one of the most under-recognized mental health conditions and is often under-recognized and under-treated in the general population. Approximately one in three medical students globally experience anxiety. Anxiety has the highest prevalence among medical students in the Middle East and Asia, and anxiety among medical students requires greater attention due to its significant implications (Tian-Ci Quek et al., 2019).

Anxiety caused by various things such as conflicts can affect the process of achieving student achievement itself (Kintan et al., 2021). High anxiety has a negative impact on cognitive functions such as memory and concentration of students, and these things influence student learning achievement which can be low. Changes in the cumulative achievement index value can be influenced by various factors, one of which is the mental health aspect Kintan et al., (2021).

These changes in mental health aspects may affect the cumulative achievement index of male and female students, especially during the COVID-19 pandemic. One in five people in Indonesia may experience anxiety during the Coronavirus Disease 2019 (COVID-19) pandemic (Thinagar & Westa, 2017). With that, there is a change in learning methods, and this has resulted in 40% of students in Indonesia experiencing anxiety and 57.2% for students outside Indonesia. With the COVID-19 pandemic that has occurred, the learning process that has long been implemented face-to-face has changed and of course this affects mental health, especially for students (Fauziyyah et al., 2021).

Many studies have linked aspects of mental health, especially stress and anxiety, with the Cumulative Achievement Index, but not enough have done it after the pandemic, which greatly affects mental health, with students being one of the categories affected, especially in the field of education.

**THEORETICAL REVIEW**
*Anxiety*

Anxiety is a psychological condition characterized by excessive feelings of worry, fear, or restlessness about something that has not necessarily happened or about situations that are considered threatening. In an academic context, anxiety often refers to academic anxiety or anxiety experienced by students related to assignments, exams, presentations, or academic achievement.

*Grade Point Average (GPA)*

Grade Point Average (GPA) or in Indonesian called Cumulative Achievement Index (IPK), is the average number of academic grades obtained by a student during a certain study period, usually calculated on a scale of 0 to 4.00.

**METHODOLOGY**

This study is an observational study with a cross-sectional model (Cross Section) to determine the relationship between anxiety levels and cumulative achievement index and the influence of anxiety levels on achievement index in assessing the relationship between independent and dependent variables in the same period in students of the Faculty of Medicine, University of North Sumatra.

This research was conducted at the Faculty of Medicine, University of North Sumatra, Medan and this research was carried out from July 2022 - October 2022.

The population in this study were students of the Faculty of Medicine, University of North Sumatra. with a Proportional stratified random sampling technique. The sample size was taken according to the total number of students in each stratum (Grade). The sample size in this study was 88 subjects with around 29-30 subjects in each grade.

**RESEARCH RESULT**

Table 1. Frequency Distribution of Respondents by Gender

| Gender | n | % |
|---|---|---|
| Man | 31 | 35.2 |
| Woman | 57 | 64.8 |
| Total | 88 | 100 |

The majority of respondents were female, amounting to 57 or 64.8%., while the majority were male, amounting to 31 or 35.2%.

Table 2. Frequency Distribution of Anxiety Levels

| Anxiety Level | n | % |
|---|---|---|
| Normal | 47 | 53.4 |
| Light | 29 | 33 |
| Currently | 7 | 8 |
| Heavy | 5 | 5.7 |
| Total | 88 | 100 |

The results that can be taken from the following table are, at a normal level of anxiety experienced by 47 respondents (53.4%). At a mild level of anxiety as many as 29 respondents (33%), followed by a moderate level of anxiety with 7 respondents (8%) and a severe level with 5 respondents (5.7%).

Table 3. Frequency Distribution of Cumulative Achievement Index

| Grade-Point Average | n | % |
|---|---|---|
| Very good | 32 | 36.4 |
| Good | 52 | 59.2 |
| Enough | 4 | 4.5 |
| Not enough | 0 | 0 |
| Total | 88 | 100 |

The results of the frequency distribution of cumulative achievement index of students of the Faculty of Medicine, University of North Sumatra in three classes from 2019-2022 obtained the highest value in the good category with a result of 59.1% (52 respondents), followed by the very good category with a value of 36.4% (32 respondents), and in the sufficient category 4.5% (4 respondents). The results of the table show that the majority of students have a cumulative achievement index in the good category.

Table 4. Frequency Distribution of Anxiety Levels by Gender

|  |  | Anxiety Level | | | | |
|---|---|---|---|---|---|---|
|  |  | Normal | Mild | Moderate | Severe | Total |
| Gender | Male | 14 (15,9%) | 10 (11,4%) | 5 (5,7%) | 2 (2,3%) | 31 (35,2%) |
|  | Female | 33 (37,5%) | 19 (21,6%) | 2 (2,3%) | 3 (3,4%) | 57 (64,8%) |
| Total |  | 47 (53,4%) | 29 (33%) | 7 (8%) | 5 (5,7%) | 88 (100%) |

The results of table 4, gender characteristics based on anxiety levels where scores below 20 have a normal anxiety level and above that number have entered a mild anxiety level and at this level of anxiety is divided into four levels, namely normal, mild, moderate, severe using the Zung Self-Rating Anxiety Scale (SAS) questionnaire. Gender is divided into two, namely Male and Female with the results of anxiety levels in male respondents, at the normal anxiety level the most with results of 15.9% (14 respondents), mild anxiety level 11.4% (10 respondents), moderate 5.7% (5 respondents) and at the severe anxiety level with the smallest percentage results of 2.3% (2 respondents). In female respondents, the normal anxiety level has the highest results, namely 37.5% (33 respondents), followed by mild 21.6% (19 respondents), moderate 2.3% (2 respondents) and severe with a slightly higher percentage than moderate anxiety level, namely 3.4% (3 respondents). The total number of male respondents had a lower percentage than female respondents, namely 35.2% (31 respondents) for males and 64.8% (57 respondents) for female respondents.

Table 5. Frequency Distribution of Anxiety Levels by Generation

|  |  | Anxiety Level | | | | |
|---|---|---|---|---|---|---|
|  |  | Normal | Mild | Moderate | Severe | Total |
| **Generation** | 2019 | 20 (22,7%) | 7 (8%) | 2 (2,3%) | 0 (0%) | 29 (33%) |
|  | 2020 | 14 (15,9%) | 14 (15,9%) | 1 (1,1%) | 1 (1,1,%) | 30(34,1%) |
|  | 2021 | 13 (14,8%) | 8 (9,1%) | 4 (4,5%) | 4 (4,5%) | 29 (33%) |
| **Total** |  | 47 (53,4%) | 29 (33%) | 7 (8%) | 5 (5,7%) | 88 (100%) |

The results of table 5, for the characteristics of the research respondents, namely the 2019 to 2021 batches of students from the Faculty of Medicine,

University of North Sumatra with the Proportional Stratified Random sampling technique, obtained a total of around 29 to 30 samples per batch with a total of 88 respondents in the three batches. In respondents from the 2019 batch, the results obtained that from normal to severe anxiety levels, the percentages were as follows, normal anxiety level 22.7% (20 respondents), mild 8% (7 respondents), moderate with a percentage of 2.3% (2 respondents) and results 0% (0 respondents) at severe anxiety levels.

For students in the 2020 intake, respondents with normal and mild anxiety levels showed the same results, namely 15.9% (14 respondents) and similar results at moderate and severe anxiety levels with a percentage of 1.1% (1 respondent). Finally, students in the 2021 intake showed results, 14.8% (13 respondents) at normal levels, 9.1% (8 respondents) at mild levels, and 4.5% (4 respondents) at moderate and severe levels.

Table 6. Characteristics of Respondents' Anxiety Levels Based on Cumulative Achievement Index and Spearman's Rho Correlation Test Results

| | | Cumulative Achievement Index | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | | Very Good | Good | Fair | Total | *p-value* |
| **Anxiety Levels** | Normal | 26 (29,5%) | 21 (23,9%) | 0 (0%) | 47 (53,4%) | |
| | Mild | 6 (6,8%) | 23 (26,1%) | 0 (0%) | 29 (33%) | 0,001 |
| | Moderat | 0 (0%) | 7 (8%) | 0 (0%) | 7 (8,0%) | |
| | Severe | 0 (0%) | 1 (1,1%) | 4 (4,5%) | 5 (5,7%) | |
| **Total** | | 32 (36,4%) | 52 (59,1%) | 4 (4,5%) | 88 (100%) | |

Table 6 provides information that the interpretation of GPA is divided into four, namely with a very good interpretation having a value of 4 - 3.51, a good interpretation with a value of 3.50 - 2.76, a sufficient interpretation of 2.75 - 2.00 and <2.00 for a poor interpretation.

Starting from the normal anxiety level, the results of the GPA interpretation are as follows, 29.5% (26 respondents) in the very good category, 23.9% (21 respondents) for the good category, and none in the sufficient achievement index category. Furthermore, at the mild anxiety level, the most results were obtained by the good achievement index category with a value of 26.1% (23 respondents), followed by the very good category 6.8% (6 respondents) and for the sufficient category, the same as at the normal anxiety level that the result was 0% (0 respondents). At the moderate anxiety level, the results obtained for the good category were 8% (7 respondents) and none got an achievement index in the very good and sufficient categories or equal to 0% (0 respondents). At the last anxiety level, namely severe, in the good category it was 1.1% (1 respondent) and 4.5% (4 respondents) in the sufficient category. Of all the results in the four cumulative achievement index categories, only respondents with severe anxiety levels got a GPA in the sufficient category. And the results of the Spearman's Rho test, the significance score is 0.001 and it can be stated that there is a relationship because the p value < 0.05.

**DISCUSSION**

This study was conducted to determine the relationship between anxiety levels and cumulative achievement index in students of the Faculty of Medicine, University of North Sumatra.

The majority of respondents were female with a total of 57 or 64.8%, while those who were male were 31 or 35.2%. In a study by Kintan et al. in 2021, where the results of the respondent data, females were the respondents who were more numerous with a percentage of 69% compared to males with a percentage of 31%.

In terms of anxiety level frequency, the highest number is owned by normal anxiety level (53.4%), then the second highest by mild (33%), there is also the lowest percentage, namely at the severe level (5.7%). When viewed in a study by NurCita and Susantiningsih in 2020, with changes in learning methods caused by the pandemic, 88% of students of the Faculty of Medicine, National Development University "Veteran" Jakarta experienced severe anxiety levels and 12% at moderate anxiety levels, and there were no respondents with mild anxiety levels. At that time, students were doing distance learning for one semester and this was a new method and this method could cause social isolation due to lack of physical and social interaction where this new thing caused students to experience culture shock, other things such as assignment burden, heavy lecture schedule burden, contracting COVID-19 and academic matters can contribute to causing anxiety (NurCita & Susantiningsih., 2020). This is different from the anxiety level from the results of a study at the Faculty of Medicine, University of North Sumatra in the 2019-2021 class where normal and mild anxiety levels dominated even though students also experienced changes in learning methods.

The results of the Cumulative Achievement Index frequency distribution show that the category most respondents have is Good (59.1%), followed by Very Good (36.4%).

From the results of the frequency distribution of anxiety levels based on gender, women have higher levels of anxiety, this is because there are more respondents in the female gender, where the number between the two genders is similar to research by Kintan et al. in 2021 with the percentage of female gender being 69% and male 31%, which also provides similarities with more respondents in the female gender.

The three classes had different results, in the 2019 class the highest percentage of anxiety levels was at the normal level, in 2020, the normal and mild anxiety levels were the same and with higher values compared to moderate and severe anxiety. Of the three classes, the youngest class, namely the 2021 class, had higher results at moderate and severe anxiety levels compared to the 2019 and 2020 classes, and the lowest results at normal anxiety levels when compared to the two classes above. where this is in accordance with research by Chris et al. in 2018 which showed that new students have higher levels of anxiety compared to students who have previously attended college. Several stress factors that can influence this include the transition from school life to university, adjustment to the environment, new friends, and quite high demands from parents (Chris *et al.*, 2018)**.**

The results obtained for the characteristics of the respondent's anxiety level based on the cumulative achievement index and the results of the Spearman's Rho correlation test, show that in the GPA with a very good category, the majority were obtained by students with normal anxiety levels, for the GPA in the good category, most were owned by respondents with mild anxiety levels. At a moderate anxiety level, the majority of respondents got the results of the achievement index with a good category, but these results did not exceed the mild anxiety level with the same achievement index category. With the results in the very good achievement index category, most were owned by respondents with normal anxiety levels and in the sufficient GPA category, most were owned by students with severe anxiety levels, it can be concluded that with increasing anxiety levels, it can affect students' cumulative achievement index. Using the Spearman's Rho Test, a significance score of 0.001 was obtained where information can be obtained that there is a relationship because the p value <0.05. In addition, from this Spearman's Rho Test, a correlation coefficient of 0.512 was also obtained, which means that the two variables have a strong relationship.

Similar results were obtained by a study by Kintan et al. in 2021, namely that there was a relationship between anxiety levels and academic achievement of students at the Faculty of Medicine, Nusa Cendana University (Kintan et al., 2021). These results are in accordance with several studies on the relationship between anxiety and academic performance which state that the higher the level of student anxiety, the lower the academic performance will be (Chris *et al.*, 2018).

Medical students are very prone to anxiety, which affects many things, one of which is academic achievement, namely the cumulative achievement index. High anxiety affects memory performance, memory can decrease, and disrupt student learning concentration. High levels of anxiety will also have an impact on the peripheral manifestation system such as a heavy head, tachycardia, restlessness, stomach problems, increased frequency of urination, and difficulty holding urine. Negative thoughts about the exam, and uncontrollable fear affect low exam results. For the Cumulative Achievement Index, this is influenced by various factors, one of which is the mental health aspect (Purnawinadi, 2021). Due to the presence of COVID-19 and the need for adjustments to learning methods that change in a certain period, of course it affects the way of learning that affects the student's achievement index. Other factors that affect the achievement index such as the role of self-concept, the influence of gender roles, the influence of family and culture, and recognition and achievement (Linda Setiawati, 2015; Riyani, 2012).

This study is in line with research by Kintan et al. in 2021, where students with moderate and severe anxiety levels more often obtained a very satisfactory GPA category and students with mild and no anxiety levels had fewer GPA categories with praise (Chris, 2018).

## CONCLUSION

The number of students of the Faculty of Medicine, University of North Sumatra was greater in the 2020 intake with 30 respondents, and 29 respondents in the 2019 and 2021 intakes. The highest prevalence of anxiety levels was at the

normal anxiety level with a value of 53.4%, followed by mild, moderate and severe anxiety levels respectively 33%, 8%, and 5.7%. Most students got a GPA in the Good category (59.1%), followed by the Very Good category (36.4%), and finally with the smallest value, namely Sufficient (4.5%).

The level of anxiety affects the cumulative achievement index with increasing levels of anxiety, the achievement index changes. In the GPA with a very good category, the majority are at a normal anxiety level and the GPA is quite the most owned by students with severe anxiety levels and it can be obtained information that the level of anxiety affects the cumulative achievement index.

It is expected that the results of this study will be input for students to know the effects of anxiety on academic achievement and can control anxiety, overcome it, change it in a positive direction, and find solutions to overcome anxiety so that it becomes a motivation to achieve good academic achievement. And in further research it is expected to conduct research on the differences in anxiety levels in academic phase students and professional phase students.

## RECOMMENDATION

Based on the results of this study, it is recommended that students become more aware of the impact of anxiety on their academic performance. They are encouraged to develop strategies to manage and control anxiety, such as practicing effective time management, engaging in healthy lifestyle habits, and seeking psychological support when needed. Educational institutions, particularly the Faculty of Medicine at the University of North Sumatra, are advised to provide mental health support services such as counseling, stress management workshops, and a supportive academic environment that prioritizes student well-being. Lecturers and academic advisors are also expected to play a proactive role in identifying students who may be experiencing high levels of anxiety and guiding them toward appropriate resources. Furthermore, it is suggested that future researchers explore the differences in anxiety levels between students in the academic and professional (clinical) phases to gain a deeper understanding of how various educational stages influence psychological conditions and academic outcomes. Lastly, the development and implementation of structured intervention programs focused on reducing anxiety and enhancing student motivation are strongly encouraged as part of a broader effort to improve academic achievement and overall mental health among medical students.

## FURTHER STUDY

Based on the results of this study, it is suggested that future research explore the differences in anxiety levels between students in the academic phase and those in the professional phase of medical education. This comparison may provide deeper insight into how various stages of medical training affect students' psychological conditions. Additionally, future studies could conduct longitudinal research to observe how anxiety levels change over time and how these changes influence academic achievement, particularly GPA. It is also recommended to investigate the effectiveness of psychological interventions

such as counseling, stress management training, or mindfulness programs in reducing anxiety and enhancing academic performance.

Moreover, future research may examine other factors that contribute to academic anxiety, including social support, workload, learning styles, and academic environment. Finally, analyzing differences in anxiety levels based on demographic variables such as gender, age, and educational background can help identify at-risk student groups and allow for more targeted mental health support strategies. These further studies are expected to contribute to the development of comprehensive approaches that help students manage anxiety effectively and improve their academic success.

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