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Research Article

Comparison of Depression Levels between Medical and Engineering Students at Universitas Muhammadiyah Jakarta

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ABSTRACT

Background: Medicine and engineering faculties are noted for their vigorous learning intensity and high degree of academic difficulty, making them vulnerable to mental health illnesses such as depression. **Purpose:** To compare depression levels between medical and engineering students at Universitas Muhammadiyah Jakarta. **Method:** This study employed a cross-sectional design. Medical and Engineering students were given the Beck Depression Inventory II (BDI-II) questionnaire. The sample size consists of 152 people, collected through purposive sampling. The Mann-Whitney test was used for analysis (p = 0.05, 95% CI). **Result:** Age 21 (25.0%) was the most frequent age, while age 17 (2.6%) was the least frequent. Based on gender, the male respondents consisted of 87 people (57.2%), and the female respondents consisted of 65 (42.8%). The medical and engineering student groups each had 76 respondents (50.0%). Only 40.8% of medical students reported depression, compared to 63.1% of engineering students (p = 0.001). **Conclusion:** Engineering students experience more depression than medical students.

Keywords: faculty of engineering, faculty of medicine, level of depression, students

INTRODUCTION

The most important aspect of human life is education. This indicates that everyone in Indonesia has the right to study and is required to advance their education. Each individual gets an educational environment that comes from the family environment (informal), the school environment (formal), and the community environment (informal) (1).

Education is very important to increase the knowledge and quality of community skills. A superior young generation is born from a quality education system (2). At the level of education after high school education, someone will continue their studies to a higher level, namely higher education. The Faculty of Medicine and the Faculty of Engineering are the two majors most in demand by students. However, both majors also have a high level of depression experienced by their students.

Medical and engineering students are known to spend a lot of time studying, practicing, and competing due to the intense and competitive nature of the academic environment. This

ultimately has an impact on the physical and mental health of students. The substantial volume of information that students are required to memorize, coupled with the limited time available for this process, frequently engenders feelings of helplessness and an inability to manage academic demands. This phenomenon can adversely affect the health and overall well-being of students, highlighting the need for effective strategies to support their cognitive and emotional needs in educational settings (3).

Suffering from depression is extremely common in everyone. According to the World Health Organization, depression is a mental condition characterized by symptoms such as negative mood, reduced interest, guilt or low self-esteem, eating or sleeping disorders, weakness, and difficulty focusing (4). According to Kaplan, depression is caused by a combination of several factors, namely biological factors, genetic factors, and psychosocial factors. These three factors can interact with each other (5). Depression is an important issue in mental health today. This is very important because depression will reduce the quality of life for people, nations, and developing countries (6).

Based on research that was conducted in Pakistan with the title "Depression among undergraduate medical and engineering students: A comparative study" with 181 medical students and 181 engineering students as respondents, the results revealed a significant difference between the two groups, with 82.87% of engineering students being diagnosed with depression, compared to 56.9% of medical students (p-value 0.05) (3). Other research on depression has also been conducted on engineering and medical students in the Northeast region of India. The results show that most medical students (95.5%) experience depression (with a higher average score) compared to only half (50%) of the engineering students in this study (p-value 0.05) (7).

Based on the description above, the authors are interested in conducting further research with the title "Comparison of Depression Levels Between Students of the Faculty of Medicine and the Faculty of Engineering, University of Muhammadiyah Jakarta." This study, in particular, has never been conducted in Indonesia, and the results of previous studies differ. This research is expected to shed light on the mental health challenges faced by students in these rigorous academic environments and contribute to a broader understanding of depression in higher education settings.

METHODS

This research was a cross-sectional study conducted to compare the prevalence of depression among students of the Faculty of Medicine and the Faculty of Engineering at Universitas Muhammadiyah Jakarta. This research was conducted in December 2022 via a Google Form that was distributed to students from the classes of 2019–2022.

The research population consisted of students from the Faculty of Medicine and the Faculty of Engineering at Muhammadiyah University Jakarta, spanning the academic years 2019-2022. The formula used to calculate the sample is the Lemeshow formula for calculating two proportions, resulting in a total sample size of 152 people, comprising 76 medical students and 76 engineering students. In this study, sampling was carried out using purposive sampling.

The inclusion criteria in this study were active students of the 2019-2022 class of the Faculty of Medicine and the Faculty of Engineering, Universitas Muhammadiyah Jakarta, who were

willing to become respondents, while the exclusion criteria were students of the Postgraduate Program of the Faculty of Medicine and the Faculty of Engineering, students who took more than 1 semester off, and and respondents who provided incomplete data in the questionnaire.

The data obtained is primary data from filling out the Beck Depression Inventory II (BDI-II) questionnaire (Indonesian version) by students of the Faculty of Medicine and the Faculty of Engineering, Universitas Muhammadiyah Jakarta, Class of 2019–2022. The Beck Depression Inventory II (BDI-II) questionnaire, in its Indonesian version, has been tested for validity and reliability in previous studies. The results of the validity test showed that the value of r-alpha is greater than 0.6, indicating that all 21 questions of the BDI-II are considered valid. Cronbach's alpha value of 0.896 means reliability (8).

The Beck Depression Inventory-II (BDI-II) is a widely used tool for assessing the severity of depressive symptoms. It provides a numerical score that falls into different categories, helping to gauge the intensity of an individual's depression. A score between 0 and 13 suggests minimal or no depression, while a range of 14 to 19 indicates mild depression. Those scoring between 20 and 28 are classified as experiencing moderate depression, and scores of 29 or higher suggest severe depression. These categories help clinicians understand the severity of symptoms and determine appropriate interventions.

This study employed both univariate and bivariate analyses. Univariate analysis is a type of analysis that fully describes the characteristics of each variable considered (9). In this study, the independent variables consisted of medical students and engineering students, and the dependent variable included the level of depression based on the BDI -II manual, namely minimal/still normal, mild, moderate, and severe depression (10). Bivariate analysis was used to test comparisons between two independent variables. In this study, we used the Mann-Whitney test (as the normal distribution was not fulfilled), and the analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 25 computer program. This study has received ethics approval from the Health Research Ethics Commission of the Faculty of Medicine and Health, Universitas Muhammadiyah Jakarta, with number 322/PE/KE/FKK-UMJ/XII/2022.

RESULTS

The distribution of respondents in table 1 shows the age range of respondents is 17–23 years, with the highest frequency being at age 21 with a total of 38 people (25.0%) and the least at age 17 with a total of 4 people (2.6%). The number of male respondents was 87 (57.2%), while the number of female respondents was only 65 (42.8%), indicating that men outnumbered women in this study. Students who became respondents came from the faculty of medicine and the faculty of engineering. Each faculty consists of 76 respondents (50.0%).

In this study, there were several inclusion criteria, one of which was being an active student in the 2019–2022 class. Based on the table above, the results show that the most respondents are in Class 2019 with a total of 49 people (32.2%), and the least are in Class 2021 with a total of 29 people (19.1%).

Table 1. Distribution of Respondents to Students of the Faculty of Medicine and Students of the Faculty of Engineering, University of Muhammadiyah Jakarta

Variables	Frequency	Percentage (%)
Age		
17	4	2.6
18	21	13.8
19	23	15.1
20	35	23.0
21	38	25.0
22	24	15.8
23	7	4.6
Gender		
Men	87	57.2
Woman	65	42.8
Faculty		
Medical School	76	50.0
Faculty of Engineering	76	50.0
Year of Class		
2019	49	32.2
2020	43	28.3
2021	29	19.1
2022	31	20.4

Table 2. Distribution of Depression Frequency in Male and Female Gender

Gender	Frequency	Percentage (%)
Men	45	51.6%
Woman	34	39.1%

Based on table 2, it was found that more men experienced depression than women. The number of men who experienced depression was 45 people (51.6%) while only 34 people (39.1%) were women.

Table 3. Frequency Distribution of Depression Levels in Students of the Faculty of Medicine and Students of the Faculty of Engineering, University of Muhammadiyah Jakarta Using the BDI-II Questionnaire

Depression Rate	Frequency	Percentage (%)
Minimal/Normal Depression	73	48.0
Mild Depression	29	19.1
Moderate Depression	29	19.1
Major Depression	21	13.8
Total	152	100.0

Based on table 3, the results show that the degree of depression in students from the Faculty of Medicine and the Faculty of Engineering, University of Muhammadiyah Jakarta, class of 2019-2022, most of the respondents experienced minimal depression (still within normal limits), namely 73 people (48.0%), while mild and moderate depression had the same number of respondents, namely 29 people (19.1%), and major depression had the same number of respondents, as many as 21 people (13.8%).

Table 4. Kolmogorov-Smirnov Normality Test

	Sig. (p-*value*)
Total Score	<0.001

Based on table 5, the results show that the value of sig. / p-value is 0.000, meaning that the data distribution in this study is not normal. If the data set is not normal, parametric statistics cannot be used, so non-parametric statistics need to be used (11). In this study, The Mann-Whitney test was utilized as a non-parametric test for student T-Test.

Table 5. Comparative Analysis of Depression in Students of the Faculty of Medicine and Engineering

Faculty	**Depression Rate**				**P-Value**
	Minimal/ Normal Depression (%)	**Mild Depression (%)**	**Moderate Depression (%)**	**Major Depression (%)**	
Medical School	45 (59.2%)	16 (21.1%)	9 (11.8%)	6 (7.9%)	0.001*
Faculty of Engineering	28 (36.8%)	13 (17.1%)	20 (26.3%)	15 (19.7%)	

**Mann-Whitney Test, Significance Level 0,05, CI 95%*

Based on Table 5, the analysis reveals a significant difference in depression levels between students from the Faculty of Medicine and the Faculty of Engineering at Muhammadiyah University Jakarta. While most medical students experience minimal depressive symptoms, engineering students exhibit a higher prevalence of moderate to severe depression. The Mann-Whitney test confirms this difference with a p-value of 0.001, suggesting that academic pressures and environmental factors may contribute differently to students' mental well-being.

DISCUSSION

Based on the data obtained from the results of the questionnaires distributed to students of the Faculty of Medicine and the Faculty of Engineering at the University of Muhammadiyah Jakarta, respondents have an age range of 17–23 years, with the highest frequency being 21 years old with a total of 38 people (25.0%) and the least being at the age of 17 years with a total of 4 people (2.6%). The age range of 17–23 years is the stage of human development from youth to adulthood. This is in line with research conducted by the National Institute of Mental Health (2020), explaining that individuals aged 18–25 have the highest rate of major depressive episodes (17.0%). Another study, also conducted by Villarroel, Ph., and Terlizzi in 2020, stated that the overall proportion of people who had mild, moderate, or severe depressive symptoms in the previous two weeks was highest among those aged 18–29 (21.0%) and lowest among those aged 30-44 (16.8%) (12). The transition from adolescence to adulthood is a critical developmental phase often accompanied by increased stress and mental health challenges. Emerging adults face heightened academic and career pressures, financial burdens, and social changes, all of which contribute to psychological distress (13). Financial independence, including managing debt and securing employment, has been identified as a significant source of anxiety during this period (14). Additionally, the uncertainty surrounding future goals and responsibilities can exacerbate pre-existing mental health conditions (15). Research also

suggests that shifts in identity, relationships, and autonomy place additional stress on young adults, increasing their vulnerability to anxiety and depression (16).

One of the risk factors that can cause a person to experience depression is gender. In this study, it was found that the sex of the most respondents was male, namely 87 people (57.2%), and for women, 65 people (42.8%). Men experience depression more than women. There were 45 men (51.6%) who experienced depression, while only 34 women (39.1%) had depressionAccording to the research findings of Chenganakkattil and Hyder in 2017, there were 79 male medical students and 71 female medical students. In contrast, the engineering program had 77 male students and 73 female students (17). In 2009, researchers Tamher and Noorkasiani found that women tend to be more effective at problem-solving compared to men. Their study suggested that men often approach problem-solving with heightened emotions, which can impact their ability to find solutions. This research highlights the differences in emotional responses between genders when addressing challenges (18). Research suggests that unmarried men may experience higher rates of depression compared to their married counterparts. Conversely, this trend appears to be less pronounced for women, indicating a complex relationship between marital status and mental health across genders (19).

Another study conducted by Assari and Lankarani in 2016 found that men are more sensitive to the triggering effects of depression from any additional long-term pressure. Men are more prone than women to develop depression as a result of stressful life experiences. Men who are depressed may not seek treatment, so they are more vulnerable to the effects of stress because they view grief as weakness. They also consider talking about emotions and getting therapy for emotional disorders, such as depression, to be signs of weakness. These beliefs greatly influence the behavior of men who need mental health care, making them vulnerable when stress and emotional problems occur (20). This also explains why men commit suicide at a higher rate than women with depression (20).

Students who became respondents came from the faculty of medicine and the faculty of engineering. Each faculty consists of 76 respondents (50.0%). The faculties of medicine and engineering are in great demand by students. However, students in both majors reported high rates of depression. The journey to graduation is not easy for students because of the many obstacles and emotional problems they face (3). Medical and engineering students are known to spend a lot of time studying, practicing, and competing due to the intense and competitive nature of the academic environment. This ultimately has an impact on students' physical and mental health (3).

Based on the year of the batch, the results show that the most respondents are in the 2019 class with a total of 49 people (32.2%) and the least are in the 2021 class with a total of 29 people (19.1%). This is in accordance with research conducted by The American College Health Association-National College Health Assessment (ACHA-NCHA) in 2011. They evaluated student journeys from years 2-4 at various educational institutions in America and found that 30% of students claim that they "feel so pressured they can't do anything about it," especially in their final year. In their final year, students have to complete their thesis as a graduation requirement, and passing it is not a simple process. Depression in final-year students who are working on their thesis is a real problem that needs attention (21).

Comparative analysis of depression scores using the Mann Whitney test showed that there was a significant difference between the incidence of depression in medical students and engineering students. The level of depression among students of the Faculty of Medicine and Engineering, University of Muhammadiyah Jakarta results show that students from the Faculty of Engineering experience more depression than students from the Faculty of Medicine. The results showed that 63.1% (76) of Engineering Faculty students experienced depression, while in the Medical Faculty only 40.8% (76) experienced depression with a p-value of 0.001 or p-value <0.05. The difference between subjects is 22.3%.

These results are in line with the results of previous studies conducted in Pakistan, namely students from the Faculty of Engineering experienced more depression than students from the Faculty of Medicine, with a total percentage of 82.87% (181) for students from the Faculty of Engineering and 56.9% (181) for students from the Faculty of Medicine. Faculty of Medicine (p-value <0.05), with a difference between subjects of 25.97% (3). Additional research that has also been conducted by Nezam et al. in 2020, it was found that engineering students (40.28%) had the highest level of depressive symptoms, followed by dental students (38.50%) and medical students (34.74%) (22).

The higher rates of depression among engineering students compared to medical students can be explained by the fact that engineering students doubt their future job security due to a slowing economy, fewer job prospects, and an increasing number of graduates in the profession. In addition, engineering students rely heavily on on-campus work placements, which are seeing a decline in the current environment. This makes it difficult for them to obtain viable and stable career prospects, adding to their pressure. In contrast to their engineering counterparts, medical students have the freedom to open their own private practice after graduation (22).

Currently available data indicate that engineering students experience illnesses including anxiety and depression at much higher rates than the general population (23). Engineering students are also less aware of seeking treatment for mental health than medical students. According to Danowitz and Beddoes in 2022 also stated that engineering students have a higher culture of stress and embarrassment, so this can cause engineering students to have different mental health limitations compared to students in other faculties (23).

CONCLUSION

Research conducted on students from the Faculty of Medicine and the Faculty of Engineering at Muhammadiyah University Jakarta revealed key insights into the prevalence of depression among them. The findings indicate that while a majority of students experience minimal depressive symptoms and remain within normal limits, a significant portion still struggles with varying degrees of depression, ranging from mild to severe.

Notably, students from the Faculty of Engineering tend to experience depression more frequently than their counterparts in the Faculty of Medicine. This disparity suggests that the challenges faced by engineering students may contribute to higher stress levels and emotional distress. Statistical analysis confirms a significant difference in depression levels between the two faculties, reinforcing the conclusion that academic environments and demands may influence students' mental well-being differently.

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CONFLICT OF INTEREST

The author has no conflict of interest and has no affiliation with or relationship with any organization or entity that may give rise to biased questions or statements in the discussion and conclusion sections of this paper.

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