FACTORS INFLUENCING DEPRESSION IN MEDICAL STUDENTS DURING THE COVID-19 PANDEMIC

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ABSTRACT

Background: Student mental health in higher education has been an increasing concern during COVID-19 pandemic. Mental health issues are the leading impediment to academic success. Mental illness can affect students' motivation, concentration, and social interactions—crucial factors for students to succeed in higher education. This study aimed to determine the factors that influence depression in medical students during the COVID-19 pandemic.
Subjects and Method: This was a cross-sectional study. A sample of 589 students were selected for this study from the Medical Study Program, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Central Java, from 2017 to 2020. The dependent variable was depression. The independent variables were age, gender, year of class, self-control, and self-restraint. Depression was measured by Beck's Depression Inventory-II (BDI-II) questionnaire. Self-control was measured by the Self-Control Scale. Self-restraint was measured by Resilience Scale-14 (RS-14). The data were analyzed using logistic regression model.
Results: The risk of depression among medical students decreased with better self-control (OR= 0.93; 95% CI= 0.91 to 0.96; p= 0.399) and self-restraint (OR= 0.94; 95% CI= 0.92 to 0.96; p= 0.003), and it was statistically significant. The risk of depression among medical students increased if female (OR= 2.24; 95% CI= 0.89 to 5.58; p= 0.032) and it was statistically significant. The associations between depression and age as well as year of class were statistically non-significant (p>0.05).
Conclusion: Better self-control and self-restraint are associated with less risk of depression among medical students. Female students have higher risk of depression than males. Age and year of class are not significantly associated with the risk of depression.

Keywords: depression, self-control, self-restraint, COVID-19, medical student.

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BACKGROUND

The prevalence of depression globally has increased along with the movement of world conditions (Hidaka, 2012). From 1990 to 2017 the number of cases of depression reached 264 million from various age categories (WHO, 2020). From 264 million cases of depression in 2010 to 2015 there was a significant increase of 18.4% (WHO, 2017). In Indonesia, in 2011 there were 17.4 million people experiencing mental disorders in the form of anxiety and depression (Sulistyo-

https://doi.org/10.26911/ICPHepidemiology.FP.08.2021.14

rini and Subarisman, 2017). Based on Infodatin (2019) the link between depression and suicide can be seen in 2016, it was stated that 23.2% of suicide cases were caused because the person concerned had a mental illness. In Indonesia, cases of mental illness which include emotional mental disorders (anxiety and depression) in 2013 had a prevalence of 6% (Riskesdas, 2013). This prevalence increased in 2018 to reach 9.8% with a depression case rate of 6.1% of the total population. Of this 6.1%, only 9% of sufferers have undergone medical treatment for depression (Riskesdas, 2018). The lack of detection of people with depression in Indonesia can reduce the quality of life of individuals and increase the number of deaths due to suicide.

The medical study program has a higher stressor value than other professional study programs (Maulida, 2013). The prevalence of depression in medical students from 1982 to 2015 globally (47 countries) was 27.2% (Rotenstein et al., 2016). In Indonesia in 2014 the prevalence of depression in medical students was 30.8% (Hadianto, 2014). Hem et al. (2000) in Yusoff et al. (2013) also stated that at least 14% of medical students had thought of committing suicide and another 6% had planned to commit suicide during their education. The high risk of medical students experiencing depression, not only requires curative and rehabilitative efforts, but also requires preventive efforts in the form of early detection.

One of the early detection of depression can be seen from the ability of self-control and self-defense. Self-control ability can be used as a significant predictor of symptoms that arise from mental instability in the form of anxiety to depression (Belanger, 2017). Self-control ability can reduce a person's desire to do something from 70% to 17% (Hoffman et al., 2012), this condition can suppress the self-motivation concerned to do negative things that can lead to problems and other pressures. Self-defense as a form of ability to regulate negative emotions that come from external and internal has a protective function against mental stability in the form of anxiety and depression (Kermott et al., 2019). This is what makes self-restraint as a predictor of depression can be used to detect a person's mental condition in the short term, one of which is during the lecture period (Wu, 2020).

The COVID-19 pandemic that has occurred in the world has changed the lecture system at Sebelas Maret University from face-to-face or offline to online or online. Students listen to learning by using applications via electronic devices. Lectures during a pandemic are indicated to increase the pressure that causes students to experience anxiety to depression (Son et al., 2020).

The research on depression experienced by medical students conducted by Hadianto (2014) has not discussed in detail the internal factors of students. This is what makes the writer interested in linking self-control and self-resilience as an individual's internal ability in dealing with the existing pressure. The purpose of this study was to determine the factors that influence depression in me-

https://doi.org/10.26911/ICPHepidemiology.FP.08.2021.14

dical students during the COVID-19 pandemic.

SUBJECTS AND METHOD

1. Study Design

This study used a cross-sectional design. The research was conducted online at Sebelas Maret University, Surakarta, Central Java in December 2020.

2. Population and Sample

The sample consisted of students from the Medical Study Program, Faculty of Medicine, UNS class 2017, 2018, 2019, and 2020, totaling 589 students. The sampling technique used was purposive sampling.

3. Study Variable

The dependent variable was depression. The independent variables were age, gender, class year, self-restraint, and self-control.

4. Definition Operational of Variables

a. Depression

Definition: emotional disturbance or poor mood usually characterized by a prolonged feeling of sadness, hopelessness, guilt, and meaninglessness.

b. Age

Definition: the period of years calculated from the respondent's birth to the last birthday.

c. Gender

Definition: biological sex division.

d. Class year

Definition: Year of admission as a medical student.

e. Self-resilience

Definition: a person's ability to adapt to bad things or misfortunes that occur in his life.

f. Self-control:

Definition: a person's ability to control himself from the stimuli or impulses he gets by considering the consequences and situations.

5. Instrument Study

Depression was measured by the Beck's Depression Inventory-II (BDI-II) questionnaire. Self-control is measured by the Self-Control Scale. Self-control was measured by the Resilience Scale-14 (RS-14).

6. Data Analysis

Data analysis used logistic regression model.

7. Research Ethics

Ethics clearance was obtained from the ethics committee of RSUD Dr. Moewardi with the number: 1.317/ XII/ HREC/ 2020. Informed consent was obtained from students and the confidentiality of respondents was maintained during data analysis.

RESULTS

Based on table 1, this study received the most respondents from the Class of 2020 who were students who were undergoing the first year of lectures. Of the 589 respondents dominated by female sex as many as 436 people (72.3%). The age range of respondents in this study was 15-23 years with the most respondents aged 20 years, namely 137 people (23.3%). Respondents were dominated by moderate level of self-control as many as 354 people (60.1%). Moderate level of self-restraint also ranks at the top with 217 people (36.8%). While the measurement of depression found 427 people (72.5%) did not experience depression and 162 others (27.5%) suffered from depression. Of these 162 people 72 people (12.2%) had

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mild depression, 61 people (10.4%) had moderate depression, and 29 people (4.9%) had severe depression.

Table 1. Distribution of Research Respondents' characteristics, Level of Self-Control, Level of Self-Defense, and Level of Depression

Category	Frequence	Percentage
Generations		
2017	151	25.6
2018	134	22.8
2019	89	15.1
2020	215	36.5
Gender		
Male	163	27.7
Female	436	72.3
Age (years)		
15	2	0.3
16	0	0
17	25	4.2
18	135	22.9
19	126	21.4
20	137	23.3
21	132	22.4
22	28	4.8
23	4	0.7
Self-control		
Very low	0	0
Low	38	6.5
Medium	354	60.1
High	187	31.7
Very High	10	1.7
Self-restraint		
Very low	61	10.4
Low	131	22.2
Medium	217	36.8
High	152	25.8
Very high	28	4.8
Depression		
Not depressed	427	72.5
Light	72	12.2
Moderate	61	10.4
Severe	29	4.9

Tabel 2. Correlation Test Results

Variable	p
Generations	0.442
Gender	0.006
Age	0.414
Self-control	<0.001
Self-restraint	<0.001

https://doi.org/10.26911/ICPHepidemiology.FP.08.2021.14

Table 3. Results of Logistics Regression Analysis

Variable	OR	95% CI		p
		Lower Limit	Upper Limit	
Age	1.21	0.69	2.12	0.675
Gender	2.24	0.89	5.58	0.032
Generations	1.36	0.78	2.48	0.584
Self-control	0.93	0.91	0.96	0.399
Self-restraint	0.94	0.92	0.96	0.003

Multivariate analysis was conducted to determine the effect of independent variables consisting of age, gender, years of age, self-control, and self-restraint with the dependent variable being depression.

Logistic regression analysis showed that the dominant factor that increased depression was gender (OR=2.24; 95%CI= 0.89 to 5.58; p=0.032), the result was statistically significant, while the factor that decreased depression was self-control (OR= 0.93; 95% CI= 0.91 to 0.96; p= 0.399) and self-resistance (OR= 0.94; 95% CI= 0.92 to 0.96; p=0.003), these results were statistically significant.

DISCUSSION

A. Sample Characteristics

This study obtained 162 medical students with depression who had an age range of 15-22 years and an average age of 19 years. Based on age classification Cuijpers et al. (2020) ages 15 to 17 years are included in the youth group and 18 to 22 years are included in the young adult group. Based on the data in table 1, nine respondents in the adolescent age group tend to have milder depression conditions than the young adult age group. This situation is in line with the research of Purborini et al. (2021) who stated that young adults are more prone to depression than other age groups. This happens because young adults tend to have to face the expectations of their family and social environment coupled with an unhealthy lifestyle.

The percentage of female respondents who experienced depression was more dominant (80.9%) than male respondents (19.1%). Overall, the number of students in the Medical Faculty of UNS in 2020 was more female students than male students, so that the respondents who filled out were also dominated by the female gender. However, this is not the main factor underlying the results of this study, there are studies that are in line with this situation where women tend to experience depression more than men (Albert, 2015). According to Albert (2015) this condition occurs due to hormonal changes that have an effect on individual physiological and psychological conditions and the characteristics of women who tend to think more about interpersonal relationships in their environment.

The largest proportion of depression in this study was obtained by medical students class of 2020 (44.4%) as first-year students during their lectures. These results are in accordance with Basnet et al. (2012) which states that first-year medical students will tend to feel excessive

https://doi.org/10.26911/ICPHepidemiology.FP.08.2021.14

pressure due to busy schedules and adjustments to academic conditions, this will lead them to symptoms of depression.

Students' self-control ability is dominated by a moderate level of self-control (60.1%). These results are in line with research conducted by Munazzah (2016) with 105 student respondents of UIN Maulana Malik Ibrahim Malang who showed a moderate level of self-control dominance (80.95%). According to him, the condition of moderate self-control where a person is in a fairly good condition in controlling himself is one of them influenced by self-discipline. Individuals can restrain and discipline themselves not to do something excessive. But on the other hand, under certain conditions this moderate level of self-control will also experience inability to resolve what is being faced. It is self-stability that determines a person in regulating his discipline.

Moderate levels make up the majority of the results of self-resistance measurements carried out in this study (36.8%). The results of this study are in line with research conducted by Amelia et al. (2014) with 119 medical students from Riau University as respondents. The research that was conducted showed that 89.07% of the respondents had a moderate level of self-restraint with various background factors that influenced the measurement results. In this study, the level of self-resistance was caused by social skills or adaptation that were still lacking. A person with limited social and communication skills will tend to keep his problems to himself so that it adds to the burden and results in the instability of his self-defense ability. In this case, the person concerned can control himself even though there are some conditions where his ability to control himself decreases due to the effects of certain things experienced.

Measurement of the level of depression showed that the majority of respondents (72.5%) were in normal condition and 162 respondents (27.5%) were depressed. Of the 162 respondents who experienced depression, the minority was in a state of severe depression (4.9%), followed by moderate depression 61 respondents (10.4%) and mild depression 72 respondents (12.2%). This percentage is lower than other research on depression. As one example is the research conducted by Martasari and Ediati (2018) on students of the Undergraduate General Medicine Study Program at Diponegoro University which used 101 respondents, 41.6% of the respondents indicated that they were depressed. By using the same questionnaire, namely the BDI-II in the study, 27.7% of respondents experienced mild depression, 10.9% of respondents experienced moderate depression, and 3% of respondents experienced severe depression. According to the study, depression is caused by pressure to achieve success, demands, and academic performance, differences in sleep quality, social relationships, and different adaptability in each student.

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B. The Relationship of Self-Control with Depression

Through this study, it was found that there was a significant relationship between self-control and depression. The better the self-control ability, the lower the probability that the person concerned will experience depression ($p<0.001$). Likewise with the opposite condition. In the research of Asthiningsih et al. (2010) found a significant relationship between self-control and depression ($p= 0.005$). Self-control that is too low is considered to make a person too regretful of the failures they have experienced and create feelings of guilt, resulting in depression. Through research Asthiningsih et al. (2010) also stated that individuals with low self-control tend to only make expectations without making maximum effort. This happens repeatedly until it can trigger the person concerned to blame the situation and the environment. The feeling of being unable to do anything or what is called a state of hopelessness slowly leads the person concerned into the depression stage.

Other studies Boals et al. (2011) revealed that there was a significant relationship between self-control ability and depression ($p= 0.001$). According to Boals et al. (2011) the results of this study relate to a person's self-control. Individuals with low self-control tend to lack self-control and choose to avoid the problems at hand. This condition will trigger other problems to arise and provide greater pressure until depression appears. Boals et al. (2011) also explained that the characteristics of this avoidance are a life style that tends to be unhealthy, alcohol consumption, and poor interpersonal relationships. Mental instability accompanied by a decrease in physical condition will lead individuals to experience depression.

C. The Relationship between Self-Defense and Depression

This study found that there was a significant relationship between the level of self-restraint and depression ($p< 0.001$). The relationship with this moderate level of closeness means that individuals with low levels of self-esteem will have a higher tendency to experience depression. Vice versa, individuals with high levels of self-restraint have a lower tendency to experience depression.

The results of this study support previous research on self-restraint and depression conducted by Firdaus and Kaloeti (2020), which is that there is a significant relationship between self-restraint and depression ($p<0.001$). The relationship that occurs in this study by Firdaus and Kaloeti (2020) explains that someone with negative emotions that are more dominant than positive emotions will tend to view problems as a burden, not as a process of life's journey. Positive emotions that are used to improve the quality of self-resistance will be eroded slowly to reduce the ability of self-resistance possessed.

Another study on the correlation between self-restraint and depression was conducted by Haddadi & Besharat (2010) on 256 University of Tehran students using a cross-sectional research design. This study revealed that there was a significant

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relationship between self-restraint and depression (p<0.001). According to Haddadi and Besharat (2010) the results of this study can be related to the theory of self-resistance which is considered a positive resistance from within to respond to a negative experience that arises. This positive resistance will bring about the stability of self-esteem as a form of defense mechanism. Haddadi and Besharat (2010) state that acceptance will reduce anxiety and other uncomfortable feelings that can encourage depression. This is why high self-restraint abilities will reduce a person's chances of experiencing depression.

D. The Relationship of Self-Control and Self-Reliance with Depression

By controlling for the confounding variables of gender, age, and generation, it was found that there was a significant relationship between self-control and self-resilience with depression with the self-resilience variable having a greater influence than the self-control variable related to depression.

Depression has many influencing factors, one of which is gender (p=0.032). Marlena et al. (2012) explained that women tend to be more prone to depression than men. It was also mentioned that gender had a significant effect on the severity of depression. This condition is because women tend to focus on the symptoms of depression. This is different from the characteristics of men where they tend to divert attention to other things such as physical activities or entertainment (Darmayanti, 2008). The second factor that was tested as a confounding variable in this study was age. The results showed that there was no significant correlation (p>0.050). These results are in accordance with the research conducted by Khest et al (2019) which revealed that there was no significant relationship between age and depression. This condition is thought to be due to the lack of a wide age range of respondents used in the study. There are many age groups, but researchers only refer to two groups, namely adolescents and young adults. The third confounding variable used is the year of class in lectures. The results of the analysis showed that there was no significant relationship between the year of class and depression (p>0.05). These results are in accordance with research conducted by Pidgeon et al. (2017) which states that there is no significant correlation between the year of class and depression experienced. The pressure experienced in lectures depends on the given academic system. This difference does not only apply between study programs or faculties but also on a university scale.

In the research of Gazmararian et al. (2000) found several factors that influence depression, including exercise routine. In this study, it was found that individuals with regular exercise had a lower chance of experiencing depressive symptoms (p=0.002). The exercise routine undertaken by the respondents is the result of their disciplined abilities. Discipline in the effort to live a healthy life is a characteristic that becomes a measure of self-control ability (Tagney et al, 2004).

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Another multivariate study conducted by Yun et al. (2019) in 1991 respondents in South Korea from August 2014 to January 2015. Using the logistic regression test method, this study describes the factors that have an influence on depression. One that is discussed is positive thoughts or positive mindset. Yun et al. (2019) explains that individuals who have positive thinking skills in dealing with stressors or problems they experience will reduce their tendency to develop depressive symptoms (p=0.002). Vice versa, if the ability to think positively is low, the individual will be more prone to depression. Positive thoughts or beliefs in dealing with problems are part of a balance of thought or equality which is one of the characteristics used to assess a person's self-restraint (Wagnild, 2010).

The results of Cho et al. (2019) in 1,502 respondents stated that individuals who have a healthy lifestyle will have a lower tendency to suffer from depression ($p < 0.001$) and individuals who are often filled with depression or feelings of sadness will tend to have a higher tendency to develop symptoms of depression ($p < 0.001$). The factor of a healthy lifestyle is a characteristic of self-control and moodiness is a form of weak balance of thinking which is a characteristic of self-resistance.

This research was carried out during the COVID-19 pandemic so that lectures were conducted through the online method (on the network) or online. Lectures during a pandemic are indicated to increase the pressure that causes students to experience anxiety to depression (Son et al., 2020). According to Son et al. (2020) this condition occurs because individuals tend to experience increased fear and worry about health compared to normal conditions and decreased interaction with other people, especially their peers due to the implementation of social distancing. This condition results in decreased concentration, disturbed sleep cycles, and excessive stress regarding academics. This is why the factor of the pandemic condition indirectly affects the measurement of depression levels carried out by researchers. Son et al. (2020) adding support to each other by sharing stories is one solution to reduce symptoms of depression in students.

According to Pedrelli et al. (2014) students tend to keep their complaints to themselves, choose to find out via the internet, and feel more comfortable consulting using web-internet-based programs because they feel that their privacy is more protected. Therefore, according to Pedrelli et al. (2014) institutions or universities need to open online screening using tested questionnaires and provide experts through an internet platform that is opened from time to time to detect cases of depression in students early.

So it can be concluded that self-restraint has a greater influence than self-control, age, gender, and class on depression. The limitation of this research is that not all students in the class have filled out the questionnaire.

https://doi.org/10.26911/ICPHepidemiology.FP.08.2021.14

AUTHOR CONTRIBUTION

Heni Hastuti, Fatin Nabila Rizqi, Mohammad Fanani, Anak Agung Alit Kirti Estuti Narendra Putri contributed in designing the research, collecting data and conducting analysis.

ACKNOWLEDGMENT

Thank you to the medical faculty of UNS and Pusdi Promkesdayamas.

FUNDING AND SPONSORSHIP

There was no external fund.

CONFLICT OF INTEREST

There was no conflict of interest.

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