



The Relationship between *Neuroticism*, Emotion Regulation, and *Academic Stress* with Depression Symptoms in Indonesian Medical Student

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Abstract

BACKGROUND: Based on the Global Burden of Disease (2017), 264 million people in the world are depressed. In college students, the depression symptoms are decreased academic performance and health problems, leading to suicide. Conservation of Resources (COR) theory reveals that each individual has internal and external resources. Based on the COR theory, depression occurs when individuals lose resources (academic), with high neuroticism and difficulty regulating emotions, so they are unable to adapt, thereby strengthening their depressive symptoms.

AIM: The purpose of this study is to examine and explain the relationship between neuroticism, academic stress, and emotional regulation simultaneously with depression symptoms in medical students.

METHODS: This study used the center for epidemiology-depression scale for depression symptoms, Big Five Inventory-II neuroticism scale for the neuroticism, the difficulties in emotional regulation scale for emotion regulation, and the perception of academic stress scale for the academic stress. Furthermore, hypothesis testing was performed using multiple regression calculations.

RESULTS: This study obtained a correlation coefficient (r) of 0.808, an F value of 83,800, and $p < 0.05$. Neuroticism, emotion regulation, and academic stress effectively contributed 65.2%, while the remaining 34.8% was affected by other factors. These other factors can be in the forms of closeness in family, health, loyal friends, and hope.

CONCLUSION: There was a relationship between neuroticism, emotional regulation, and academic stress with depression symptoms in medical students.

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Keywords: Depression symptoms; Neuroticism; Emotion regulation; Academic stress

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Introduction

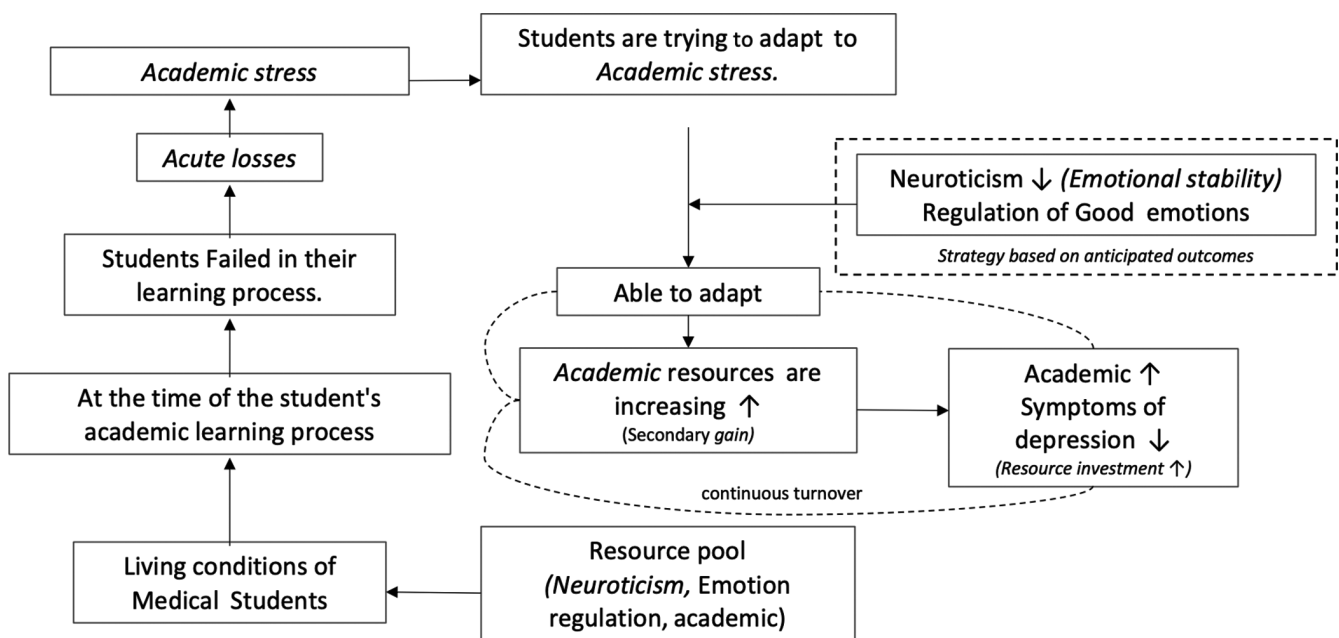
Depression is predicted to take the first rank to contribute to the global burden of disease by 2030 [1], [2]. Based on Global Burden of Disease (2017), the number of individuals with depression is 264 million globally. Meanwhile, 53% of students in the United States experience depression since entering the university. This figure is not much different from France, Kenya, and Malaysia [3], [4]. The prevalence rate of women is much higher than that of men; there are one in six people affected by depression, and the rate in women is 2 times higher than that of men [5], [6].

The prevalence of individuals who experience depression symptoms in the United States increased in 2019, gained individuals who experienced mild-to-severe depressive symptoms by about 52.5% [7]. In Indonesia, the prevalence has reached 3.7% or about 9 million people who experience depression [3], [8], [9]. Based on the Ministry of Health of the Republic of Indonesia, 14 million people aged 15 years old and above experienced mental disorders in 2013, including anxiety and depression [9], [10]. Particularly among medical students, the causes of depression symptoms include

student interest in the field studied, age; in which students with older ages are more susceptible to the emergence of depressive symptoms due to more stressors, such as the economy, graduation targets, work, and married life [11]. Meanwhile, the socioeconomic factors include the students with low family economic conditions are more at risk of experiencing depression symptoms [11].

There are several factors causing individuals to experience depression symptoms based on the Conservation of Resources (COR) theory proposed by Hobfoll and Golembiewski (1998, 2000). In this case, each individual has internal and external *resources*. Internal resources are *resources* that the individual owns. When an individual loses *resources*, the individual may experience *acute losses* [12]. Individuals who do not adapt at the time of *resource* loss will experience a second loss, leading to chronic losses [13]. Personality in COR theory plays a role in helping individuals adopt when they lose *resources*. Therefore, individuals will not experience *secondary losses* and chronic losses. This can strengthen the depression symptoms emerged [14].

Eysenck's personality theory (1967) explained three dimensions of personality: Extraversion, *Neuroticism*, and *psychoticism*. *Neuroticism* in individuals has strong heredity. Research that has been conducted previously



AQ4 Figure 1: Theory schema conservation of resource based on the secondary gain in medical student

found that people who have high scores in Neuroticism tend to overreact emotionally and have difficulty returning to normal after being emotionally stimulated. Eysenck accepts *the diathesis–stress model*, which means that some individuals are more susceptible to disease because of genetic factor or learned weaknesses make them vulnerable. Inventory developed by Eysenck measures *extraversion* and *neuroticism* independently with almost zero correlation [15].

This supports the finding that individuals with neuroticism have a low tolerance to stress and is also aversive to stimuli. Individuals with high neuroticism often interpret ordinary situations as threatening and minor frustrating conditions as hopeless difficulties [16], [17].

Improper regulation of emotions can be one of the factors individuals experience depression symptoms. Individuals who experience depression symptoms are known to have improper emotional regulation, especially during adverse situations; in which the individual has difficulty regulating negative emotions. Experiencing negative emotions for a long time can emerge the possibility of the individual experiencing depression symptoms [18]. Individuals who have difficulty regulating emotions can be in the form of *rumination*. Individuals with high neuroticism are more likely to regulate their emotions with *rumination* [19]. *Rumination* is the thought of individuals who constantly think about the causes and outcomes of adverse events and feelings arising from the negative event regardless of the problem-solving of the event [19], [20]. *Neuroticism* attends to instability in emotions and adapts individuals who are more neurotic, have excessive happiness, and indulge in negative affect [21]. *Neuroticism* influences the way individuals think, so individuals with high *Neuroticism* often focus on negative things and continuously feel

and think about them. It can be a habit of the individual to regulate his emotions with *rumination* [19].

This inappropriate emotional regulation method cannot only cause depression symptoms but also increase recurrence in individuals with improper emotional regulation and depression symptoms compared to individuals who experience depression symptoms but have proper emotional regulation [18]. Individuals with high neuroticism are more sensitive and emotional to stimuli so that the individual more easily falls into hostile conditions. Individuals with it become quickly and have a more regular frequency to think about the adverse condition than the individual's low neuroticism; the cycle will become the individual's habit to use *rumination*. Being focus can cause individuals to think about their adverse condition and it will continuously worsen the negative effect so that it is more likely emerge the depression symptoms [19].

Methods

The population in this study was medical students in Malang. The characteristics of the intended population are the 4th year medical students who will complete the academic stage and enter the professional stage. The hypothesis test in this study serves to test the relationships between independent and dependent variables. The hypothesis test employed multiple regression or double regression calculations. Multiple regression tests were also used to analyze the level of the relationship between independent variables and dependent variables.

The samples involved are 138 participants consisting of 71 women and 67 men. The average

age of the participants was 20–24 years old. A total of 134 participants have an average family income in the upper-middle category. All participants were in the 4th year of medical school.

The center for epidemiology-depression (CES-D)

This instrument consists of four answer options, namely, 0 (no symptoms/never) and 3 (there are severe symptoms/almost always/always). The greater the number given, the more depression symptoms emerge. CES-D was developed by the National Institute of Mental Health Center for Epidemiology Scale; the CES-D scale can be used in clinical and non-clinical communities. In this study, the Indonesian version of CES-D was used.

There are 20 items on the CES-D scale: Depressive affect, positive affect, somatic disorder complaints, and interpersonal relationship disorders. On the CES-D scale, seven items represent depressive affect, four items represent positive affect, seven items represent somatic disorder complaints, and two points represent interpersonal relationship disorders.

Big five inventory (BFI-II)

Neuroticism measurements use the BFI scale that measures *extraversion*, *agreeableness*, *conscientiousness*, *neuroticism*, and *openness*. There are eight questions for *extraversion*, nine questions for *agreement*, nine questions for *conscientiousness*, eight questions for neuroticism, and 10 questions for *openness*. This instrument consists of 44 questions and five answer choices, namely, 0 (strongly disagree) and 5 (strongly agree). This study used the BFI neuroticism with negative *emotionality* aspects. The Indonesian version of the BFI neuroticism was used in this study [22]. This refers to the research that individuals with neuroticism can cause the individuals to experience depression [23]. The Big Five is allowed to take aspects of neuroticism alone [24]. This is because individuals with neuroticism have a high, negative effect that individuals with neuroticism be susceptible to depression. Based on Eysenck and Eysenck, 164 explain that neuroticism can be measured independently, with almost zero correlation.

Difficulties in emotional regulation scale (DERS)

Measurement of emotion regulation was done using the DERS with five answer options, namely, 1 (never) and 5 (always). There are 36 questions on the DERS scale, namely, six items representing a response to unacceptable emotions, five points representing difficulty behaving bound to a specific purpose, six points representing difficulty controlling impulses, six

points representing difficulty in realizing emotions, eight points representing the limitations of strategies to regulate emotions, and five points representing the difficulty in explaining emotions. The Indonesian version of the DERS was used in this study.

Perception of academic stress (PAS)

The measurement of *academic stress* using the PAS scale contained 18 questions. The Indonesian version of PAS was used in this study. There are three subscales on PAS, namely, the academic expectation scale (four items), the workload and examination scale (eight items), and the *self-perception* scale for academic students (six items). The PAS scale was measured using a questioner with a Likert model; there are 5 Likert points, 1 is very irrelevant, and 5 is very relevant.

In this case, the hypothesis test used multiple regression or double regression calculations. Multiple regression tests were also used to analyze the level of the relationship between the independent variables and dependent variables.

Results

Reliability test was conducted using alpha Cronbach with results obtained depression measuring instrument (CES-D) obtained CITC at the range of 0.198–0.834 without any items aborted (Table 1). The number of CITC values that are not aborted due to consideration of the value of alpha Cronbach is 0.948 with a fair value (>0.7). In the BFI neuroticism, there is a range of CITC of 0.382–0.759, and no item was dropped with an alpha Cronbach value of 0.907 so that the BFI-N gauge can be declared reliable with a fair value (>0.7). The emotional regulation measuring instrument (DERS) was obtained from the CITC at the range of 0.482–0.770 with six items dropped. A total of six items were dropped because these items are lower than the reliability score of DERS. Item number 1 has CITC of 0.191, number 7 has CITC of 0.65, number 11 has CITC of 0.042, number 20 has CITC of -0.036 , number 22 has CITC of -0.044 , and number 24 has CITC of -0.165 . The alpha Cronbach before the elimination of item was 0.931, while after eliminating the six items, it became 0.955. The *academic stress*

Table 1: Reliability test CES-D, BFI-N, DERS, and PAS

No	Variable	Corrected item total correlation	Eliminated items	Used items	Alpha Cronbach
1.	Depression	0.198–0.834	-	20	0.948
2.	Big Five Inventory (Neuroticism)	0.382–0.759	-	12	0.907
3.	Regulation of emotions	0.482–0.770	6	30	0.955
4.	Academic stress	0.306–0.734	-	18	0.884

CES-D: Center for epidemiology-depression, BFI-N: Big Five Inventory, DERS: Difficulties in emotional regulation scale, PAS: Perception of academic stress.

measuring instrument PAS obtained CITC value at the range of 0.306–0.734 without any items eliminated with satisfying reliability and alpha Cronbach value of 0.884.

Table 2 describes a link between neuroticism, emotional regulation, *academic stress*, and depression symptoms in medical students. Based on the above analysis results, we obtained *coefficients correlation (R)* of 0.808, values F of 83,800, and $p=0.000$. Thus, since $p<0.05$, the H_0 is rejected and H_1 is accepted with a significant value. Based on this, it can be concluded that there is a relationship between neuroticism, emotional regulation, and *academic stress* with depression symptoms. The value of $R^2=0.652$ indicates that depression symptoms are simultaneously influenced by neuroticism, emotional regulation, and *academic stress* by 65.2%. Meanwhile, the remaining 34.8% of depression symptoms are affected by other variables that were not disclosed in this study.

Table 2: Hypothesis test

Hypothesis	IV-DV correlation	r	R square	F	Sig
The relationship between <i>Neuroticism</i> , emotional regulation, and <i>academic stress</i> with depression symptoms in medical students	Depression symptoms, Neuroticism, Emotion Regulation, <i>Academic Stress</i>	0.808	0.652	83.800	0.000

Discussion

The results obtained support COR theory that *neuroticism* and emotion regulation can be an *individual's internal resources*. *Neuroticism* is based on Eysenck's theory (1967) that individuals with high *neuroticism* have stress relatedness compared to individuals with low *neuroticism*. In contrast, the external resources owned by medical school students are the process of academic life. Based on the COR scheme, *broader life condition* is a student's living conditions either broadly or specifically in their academic life. In the context of students, the academic process becomes an external resource because learning achievement is assessed from its academic success. When students fail to undergo the academic process, students will experience *acute losses*. This means that students lose these *resources*, with the academic burden that exists in the 4th year of medical school who must complete the grades during the academic stage with a minimum of C score, final assignments, and the clinical chivalry examination that is included in the *academic stress* aspect, namely, stress related to academic assignments and examinations. By the COR scheme, students experience *acute losses* (Figure 1). Students who have difficulty regulating emotions and also have high *Neuroticism* have difficulty in adapting because they are more sensitive to the stress experienced so that negative emotions often appear. In addition, it also has an impact on the regulation of student emotions,

difficulty in making decisions, thinking clearly, and doing effective coping. Therefore, *neuroticism* and difficulty in emotional regulation can influence the unsuccessful *adaptation* experienced while undergoing academic life. The condition of difficulty regulating emotions and high neuroticism will bring secondary *losses*, which has the impact of chronic *losses* (symptoms of strengthened depression). This turnaround explains *principle 1 (Primacy of losses)* proposed by Hobfoll (2018), where the *obtained resources* are less than the *lost ones*.

Conclusion

Based on the results of research consisting of hypothesis tests, data analysis, and discussions above, it can be concluded that:

1. High neuroticism, difficulty in regulating emotions, and academic stress have an essential role in developing depression symptoms in medical students. High neuroticism does not solely cause students to experience depression symptoms. However, difficulty in regulating emotions and experience in academic stress can cause students to experience depression symptoms.
2. Students who experience academic stress and have fewer resources (high neuroticism and difficulty in regulating emotions) will tend to experience *unsuccessful adaptation* so that it causes symptoms of more substantial depression (secondary losses). This can lead to *chronic losses*.

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