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The positive and negative relationship between the source of the problem and self-esteem with the occurrence of mental health disorders among undergraduate students: Structural equation modelling of depression, anxiety, and stress

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Abstract---Introduction: University students with mental health problem has risen significantly over the past few years. The increasing number of freshmen students was detected to have a tendency for mental and emotional disorders. Purpose: The primary objective of this study was to find a model of factors that influence depression, anxiety, and stress among undergraduate students. This model could identify factors that have positive and negative effects on depression, anxiety, and stress among undergraduate students. Methods: This is a cross-sectional quantitative study using an equal probability sampling method with stratified random sampling to get a proportional sample in each school and faculty in the subject

university. Variables measured in this study include problem source, self-esteem, social support, coping, depression, anxiety, and stress. Analyzed using structural equation modelling (SEM). Results: Self-esteem had a negative relationship with the occurrence of depression, anxiety, and stress (t-value $-5.56 > 1.96$), while problem source had a positive relationship with the occurrence of depression, anxiety, and stress (t-value $5.02 > 1.96$). Conclusion: This study reflects that source of the problem factor has a positive influence on depression, anxiety, and stress while the self-esteem factor has a negative influence on depression, anxiety, and stress among undergraduate students. Coping and social support factors are shown to not directly affect depression, anxiety, and stress among undergraduate students but have positive influences on self-esteem. Interventions need to be developed and implemented to increase self-esteem so that students can overcome depression, anxiety, and stress. In addition, training that focuses on stress management must be included in the curriculum and follow-up studies are needed to further evaluate the success of the implemented student stress management program.

Keywords---undergraduate student, depression, anxiety, stress.

Introduction

Mental health problem is an issue faced by all human beings in their daily lives at home, in school, in the workplace, as well as in recreational activities. The primary mental disorders include emotional disturbances and anxiety disorder, depression, schizophrenia, and dementia (Lavikainen, Lahtinen, and Lehtinen, 2001). The prevalence of severe mental disorders in the Indonesian population is 1.7 per mile, while the prevalence of mental-emotional disorders in the Indonesian population is 6.0% (IBHR, 2013) with women having a higher prevalence of mental-emotional disorders than men. In addition, the prevalence of mental-emotional disorders in the 15-24 years and 25-35 years age groups are 6% and 5%, respectively (IBHR, 2013). For depression and emotional mental disorders, the prevalence among the Indonesian population aged ≥ 15 years old is 6.1 per mile while the prevalence of emotional mental disorders is about 9.8 per mile based on the Indonesian Basic Health Research 2018 (Ministry of Health of the Republic of Indonesia, 2018).

A study on nursing students of Cirebon Health Science Polytechnic shows that 55.8% of these students experienced stress at a moderate level while 31.2% experience stress at a severe level (Suwartika, Nurdin, and Ruhmadi 2014). Stress was also identified among medical students at the University of North Sumatra, with 61% experiencing moderate stress and 4% experiencing severe stress. In these students, most students who experience stress are 19 years old and 20 years, with male students having a higher stress level (Pathmanathan, Husada, and Kj 2013).

An initial survey was conducted in the middle of the even semester of 2017 in 3 (three) schools in a state university in Jakarta by distributing questionnaires to

560 undergraduate students. Of these, 449 students completed the questionnaire. The results of the initial survey showed that 45% of the students experience very severe depression, 68% experience anxiety, and 22% experience stress (EL-Matiry, Lestari, and Besral 2018).

An initial data from a university clinic, on mental health problems among freshmen students at Public University in Jakarta, had identified several health problems, including the increasing number of freshmen detected to have a tendency for mental emotional disorders, i.e., from 3.7% in 2015 to 9% in 2016 and to 12.47% in 2017. The number of psychological counselling visits at the university clinic also increases during the period of 2008 to 2016. It is shown that 46% of students experience very severe depression, while 68% and 22% of students experience very severe anxiety and very severe stress, respectively.

Studies on factors influencing depression, anxiety, and stress tend to stand alone and studies that simultaneously test for depression, anxiety, and stress are scarce although there is a need for empirical evidence of factors contributing to and influencing the occurrence of depression, anxiety, and stress among students in Indonesia. Thus, the purpose of this study is to examine factors influencing depression, anxiety, and stress to create a model of factors causing depression, anxiety, and stress in university students.

Methods

This is a cross-sectional quantitative study using an equal probability sampling method with stratified random sampling to get a proportional sample in each school and faculty in the subject university. The sample size was calculated using the correlation coefficient test formula. Factors measured in this study include, among others, problem source, self-esteem, social support, coping, depression, anxiety, and stress.

The items in the problem sources were built upon students' complaints during counselling at Makara UI Satellite Clinic and from several articles on student's problems. Findings from the reliability analysis showed that all variables in the problem source had high internal consistency with a Cronbach's alpha of 0.914 (> 0.7) while the validity testing presented a corrected-item total correlation $> t$ table value of 0.105. The 50 variables in the Problem Source were reduced using the confirmatory factor analysis (CFA) with structural equation modelling (SEM) into 24 valid variables with $t \geq 1.96$. The measurement model analysis of Problem Sources used the Confirmatory Factor Analysis (CFA) to test the dimensionality of a construct between latent variables and unobserved variables. There were 50 problem source variables and the CFA results showed that 50 problem source indicators built the problem source variables. The results of the analysis demonstrated that 25 indicators were able to explain the latent variables as indicated by the value of $t \geq 2$ and the standardized loading factor of < 0.3 . Analysis of 12 indicators that built the social support variables (social support) was also carried out and the result showed that all indicators could explain latent variables as indicated by the value of $t \geq 2$. The CFA results showed that of the 12 coping indicators, 6 indicators had a weak ability to explain latent variables (t value < 2 and standardize loading factor < 0.3). The variables of depression, anxiety

and stress of the model tested consisted of 21 indicators and the CFA analysis showed that all indicators were able to construct constructs to explain latent variables (t value ≥ 2).

The self-esteem factor is measured using the Rosenberg Self Esteem Scale instrument originally developed by Rosenberg (1965). This self-esteem assessment includes feelings towards self, 5 statements for positive assessment, and 5 statements for the negative assessment. The scale for positive self-assessment starts from 1, 2, 3, to 4 while the scale for negative self-assessment starts from 4, 3, 2, to 1. All statements have been tested for reliability with a Cronbach's alpha of 0.749 and tested for validity with the corrected-item total correlation $> t$ table value of 0.105. This shows that the instrument was valid and reliable to be used for student respondents. The instrument was tested by CFA during SEM analysis using a t-test and, of the 10 items, only 6 items were valid with $t \geq 1.96$.

The social support factor was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) instrument from Zimet et al. (1988). The questionnaire in MSPSS includes support from the family, support from friends, and support from others. This MSPSS originally used a Likert scale with 7 scales, namely strongly disagree, disagree, somewhat disagree, neutral, rather agree, agree, and strongly agree. It was to change the scale into a 4-point scale, i.e., strongly disagree, disagree, agree, and strongly agree. The try-out showed a non-valid result due to the confusion experienced by the respondents regarding the scale that they tended to choose neutral answers. It was revised into a 4-point scale, a re-trial was carried out and all MSPSS questionnaires were found to be valid and reliable. Variables on social support have been tested for reliability with a Cronbach's alpha value of 0.877 and tested for validity with a corrected-item total correlation that was higher than the t table value of 0.105. The MSPSS instrument was tested by CFA during SEM analysis using the t-test, with all items considered valid with a t value of ≥ 1.96 .

The coping factor was assessed using the brief cope instrument developed by Carver (1997). This instrument has 14 scales, each of which has 2 redundant statements, so the total number of statements is 28. The researchers chose 1 item for each scale and 2 scales were not used because during the instrument testing, these two statements were not valid; hence, the number of statements became 12. Variables on coping tested for reliability with a Cronbach's alpha value of 0.658 and for validity with a corrected-item total correlation which was higher than the t table value of 0.105. The instrument was tested by CFA during the SEM analysis using the t-test with only 7 items valid from 12 statements with $t \geq 1.96$.

Depression, anxiety, and stress factors were assessed using the depression, anxiety, stress scale (DASS) 21 instrument, which is a shortened version of DASS-42 developed by Lovibond and Lovibond (1995). DASS-21 has fewer items, so it does not need much time and the results are more stable. The instrument used was the DASS-21 instrument which has already been translated by Damanik (2006) and tested for validity and reliability with results showing that the instrument was valid and reliable. Variables on depression, anxiety, and stress were already tested for reliability with a Cronbach's alpha value of 0.910 and tested for validity with a corrected-item total correlation that was higher than the

t table value of 0.105. The instrument was tested by CFA during SEM analysis using a t-test on the structural model equation analysis and all statements were declared valid with $t \geq 1.96$ and the goodness of fit criteria also reflects good criteria to be included in the structural equation model.

Analysis in this study was performed using structural equation modelling (SEM) to thoroughly identify and explain the relationships between variables in the study. SEM could show unobserved concepts and relevant relationships in them and calculate the measurement errors. SEM presents unobserved concepts using latent variables. Data analysis was performed using computer software.

Results

The sample calculation required a total sample of 704, which was divided into 3 schools, i.e., 175 from the School of Health Sciences, 229 from the School of Science and Technology, and 300 from the School of Social Science and Humanities.

Subject Characteristics

The characteristics of students selected as participants of this study are described in Table 1.

Table 1 Respondent Characteristics

Characteristic	n=704 (%)
Gender	
Male	315 (44.7)
Female	389 (55.3)
Age	
< 20 y.o	302 (42.9)
≥ 20 y.o	402 (57.1)
Academic Cluster	
Health	175 (24.9)
Science and Technology	229 (32.5)
Social and Humanities	300 (42.6)
Grade Point Average	
<3.0	40 (5.7)
≥ 3.0	664 (94.3)
Self-esteem	
Low	25 (3.6)
Moderate	534 (75.9)
High	145 (20.6)
Social support	
Low	21 (3.0)
Moderate	399 (56.7)
High	284 (40.3)
Coping	
Low	109 (15.5)
Moderate	587 (83.4)

Characteristic	n=704 (%)
High	8 (1.1)
Depression	
Normal	45 (6.4)
Mild	60 (8.5)
Moderate	169 (24)
Severe	133 (18.9)
Very Severe	197 (42.2)
Anxiety	
Normal	50 (7.1)
Mild	67 (9.5)
Moderate	92 (13.1)
Severe	113 (16.1)
Very Severe	382 (54.3)
Stress	
Normal	277 (39.3)
Mild	92 (13.1)
Moderate	111 (15.8)
Severe	102 (14.5)
Very Severe	122 (17.3)

Female students contributed the largest proportion of respondents. Students who had a GPA of ≥ 3.0 also represented the largest proportion of respondents. The same was true for respondents aged ≥ 20 y.o. Students in the social science and humanity cluster constituted the largest proportion of respondents. In terms of depression, anxiety, and stress, the largest proportion of students experienced depression, anxiety, and stress at a "very severe" level. Most students had "medium" self-esteem and received "moderate" social support and management regarding the problems faced by students.

Model

The initial stage of structural equation modelling (SEM) analysis in this study began with specifying the research model that would estimate the problems to be studied and show the relationship between the variables to be analyzed. There were 5 (five) latent variables in this study with 105 (one hundred and five) indicators/variables observed.

The structural equation model analysis produced a structural model, namely latent variables that caused the incidence of depression, anxiety, and stress. This model showed that the problem source variables and the self-esteem variables, directly caused depression, anxiety, and stress while the coping and social support variables, did not directly cause depression, anxiety, and stress but directly influenced self-esteem variables. The following figure depicts the structural equation model developed in this study.

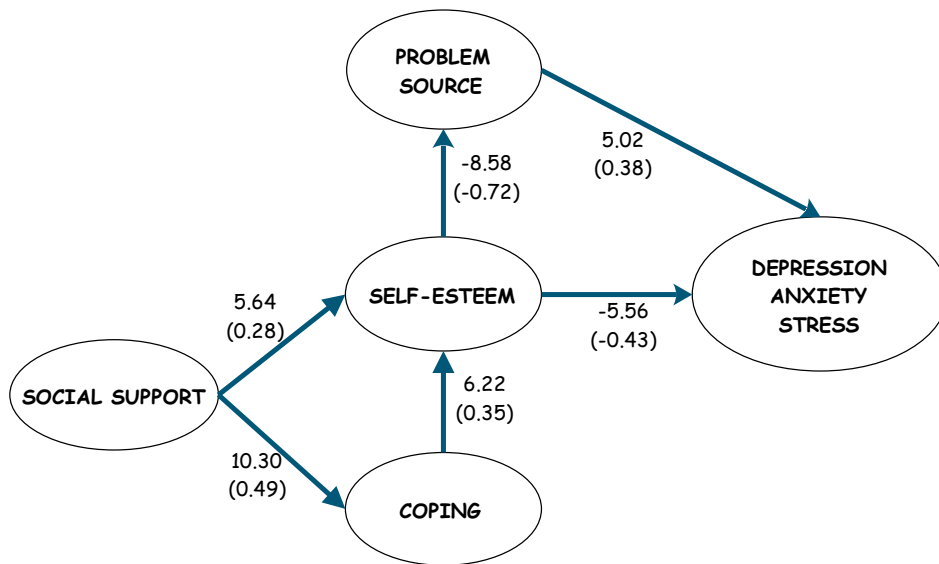


Figure 2. Structural equation modelling of depression, anxiety, and stress among university students

Self-esteem had a negative relationship with the occurrence of mental health disorders (t-value $-5.56 > 1.96$), while problem source had a positive relationship with the occurrence of mental health disorders (t-value $5.02 > 1.96$). Social support and coping had no direct relationship to the occurrence of mental health disorders while self-esteem had a negative relationship with the problem source. Self-esteem and social support had positive relationships with coping and social support were positively related to self-esteem.

Discussion

This study demonstrates a positive and significant relationship between the problem source factor and depression, anxiety, and stress. Hence, it can be interpreted that when the problem source is high, students will experience depression, anxiety, and stress, or vice versa. In other words, depression, anxiety, and stress are influenced by the source of problems faced by students. The analysis found a negative and significant relationship between self-esteem factors and depression, anxiety, and stress, which means that if students have high self-esteem, they will not experience depression, anxiety, and stress or vice versa. In other words, depression, anxiety, and stress are influenced by students' self-esteem. On the other hand, no significant relationship was identified between coping and depression, anxiety, and stress. This means that a high-level coping skill does not directly affect depression, anxiety, and stress but indirectly influences them through self-esteem. Results are seen with no significant relationship between social support and depression, anxiety, and stress, meaning that high and low social support does not have a direct effect on depression, anxiety, and stress but indirectly influence them through coping and self-esteem. The result of this study is in line with other studies stating that the use of adequate and appropriate coping model during adolescence facilitates the development of healthy personalities and high self-esteem formation (Yıldırım et

al. 2017) and that coping is also an underlying indicator of psychopathology development for individuals with high self-esteem and those with low self-esteem (Lee 2013) .

Findings in this study are also consistent with other studies that stated students with high self-esteem will be able to deal with stress experienced during education more effectively (Yıldırım et al. 2017). Another study (Guindon 2010) also shows that low self-esteem is strongly associated with depression and that people with low self-esteem is easier to experience emotional stress, including depression and anxiety. Findings in another study also show that low self-esteem is a risk factor for mental health problems and positive self-esteem is a protective factor against mental health problems (Mulligan 2011). Results of various studies indicate that when comparing people with high self-esteem to those with low self-esteem, it is observed that people with low self-esteem experience have more negative emotions which affect, among others, anxiety, sadness and depression, hostility and anger, social anxiety, shame and guilt, shame, loneliness, and other negative influences and neuroticism (Mruk 2013).

Thus, it can be concluded that the incidence of depression, anxiety, and stress among students is caused by the problem source received by the students and the students' own self-esteem. Therefore, it is necessary to perform promotive, preventive, and early detection efforts as well as provide counselling services for all students and the academic community. The problem source factor has a positive and significant relationship with the occurrence of depression, anxiety, and stress when the problem source score is high, the depression, anxiety, and stress experienced will be severe or very severe. Meanwhile, self-esteem has a negative and significant relationship with the occurrence of depression, anxiety, and stress when the self-esteem score is high, the depression, anxiety, and stress experienced will be mild.

The University Clinic has carried out promotive and preventive activities including, among others, a peer counsellor and health educator program as well as a peer counsellor and health educator training for selected students. Early detection activities are also performed in the form of health examinations for new students, periodic medical examinations for foreign students, and the establishment of the Integrated Development Post (*Posbindu*). In terms of counselling services, offline and online counselling services are available for students. Information regarding the services is disseminated and lecturers also join counsellor training. These lecturers also play a role as faculty counselling managers. Peer Counselor and Health Educator (PCHE) activities are also implemented and collaborations for these activities are built with institutions on campus and from outside the campus. Seminars are also performed for students, such as seminars on stress management for new students and training for *bidikmisi* (students who receive scholarships due to their low economic status) and affirmation program beneficiary students (KlinikSatelitMakara 2016).

However, some improvements are still needed, including the dissemination of equitable counselling services; socialization of collaborative activities carried out in all faculties; *Posbindu* activities in all faculties; and availability of counsellors in all faculties. Overall, a more massive intervention program is needed to

overcome depression, anxiety, and stress experienced by students during their education process. Interventions need to be developed and implemented to increase self-esteem so that students can overcome depression, anxiety, and stress. In addition, training that focuses on stress management must be included in the curriculum and follow-up studies are needed to further evaluate the success of the implemented student stress management program.

Conclusion

This study shows that depression, anxiety, and stress are influenced by the source of problems faced by students and students' self-esteem, and there is no direct effect of social support on depression, anxiety, and stress but it indirectly influences them through coping and self-esteem. It is necessary to plan and implement a policy so that clinics in all universities/higher education conduct early detection interventions for the possibility of physical and mental-emotional disturbance that might be experienced by the students by performing routine checks. Students who have a tendency for emotional disturbances should be followed up with actions, supervision, and coaching program at the faculty and study program level. The capacity of the counselling room and counselling services in the clinic should be improved to enable immediate interventions for students who need them and to shorten the waiting list for a counselling appointment to up to one day. Guidance and counselling services should be provided in each faculty so more students can access the service easily. Planning and implementation of programs/interventions are needed through programs such as seminars, talk shows, and discussions that can help students overcome depression, anxiety, and stress. Training that focuses on addressing problem sources and increasing self-esteem should be included in the curriculum and further studies should be conducted to evaluate the success of the existing policies and programs at the university and National levels. The results of this study can be used as considerations when developing prevention and treatment programs for mental health disorders, including depression and anxiety so that when students work in the future, they will already have a good coping mechanism and will not experience depression and anxiety.

Conflict of interest

The authors declare that there are no conflicts of interest.

Ethical clearance

This study was approved by the Ethical Committee of Public Health Faculty of Universitas Indonesia number: 482/UN2.F10/PPM.00.02/2017. Informed consent was obtained from all participants before filling out the questionnaire.

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