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The Influence of Coping Strategy, Loneliness, and Sleep Quality on Student's Depression During Covid-19 Pandemic

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Abstract

This study aims to examine the effect of the variable coping strategy, loneliness, and sleep quality on symptoms of depression in college students during the Covid-19 pandemic. The authors hypothesized that coping strategy, loneliness, and sleep quality had significant effects on symptoms of depression in students during the Covid-19 pandemic. The population in this study was students who domiciled in Greater Jakarta and were undergoing online lectures during the Covid-19 pandemic. A sample of 203 students were recruited using purposive sampling. The measuring instrument consisted of the Beck Depression Inventory-II scale, The Brief COPE scale, the De Jong Gierveld Loneliness Scale, and The Pittsburgh Sleep Quality Index scale. We tested the validity of the instrument using the Confirmatory Factor Analysis (CFA) technique. The data were analyzed using multiple regression techniques. The results of hypothesis testing indicated that four variables, namely problem-focused coping, emotional loneliness, social loneliness, and sleep quality, significantly influenced symptoms of depression. This study's results showed significant effects of coping strategy, loneliness, and sleep quality on depression symptoms in college students during the Covid-19 pandemic, 52.3%. Meanwhile, avoidant, emotion-focused, and socially-supported coping did not significantly affect students' depression symptoms during the Covid-19 pandemic.

Keywords: college students, coping strategy, covid-19 pandemic, depression, loneliness, sleep quality

Abstrak

Penelitian ini bertujuan untuk menguji pengaruh variabel coping strategy, loneliness, dan kualitas tidur terhadap gejala depresi pada mahasiswa selama pandemi Covid-19. Penulis berhipotesis bahwa terdapat pengaruh yang signifikan coping strategy, loneliness, *dan kualitas tidur terhadap gejala depresi mahasiswa di masa pandemi Covid-19. Populasi dalam penelitian ini adalah 203 mahasiswa/i aktif berdomisili di Jabodetabek yang sedang menjalani perkuliahan daring selama masa pandemi Covid-19. Sampel diambil menggunakan teknik* non-probability sampling *yaitu* purposive sampling. *Penulis memodifikasi alat ukur yang terdiri dari skala* Beck Depression Inventory-II*, skala* The Brief COPE, *skala* De Jong Gierveld Loneliness Scale*, dan skala* The Pittsburgh Sleep Quality Index*. Uji validitas alat ukur menggunakan teknik* Confirmatory Factor Analysis (CFA). *Analisis data menggunakan teknik regresi berganda. Hasil penelitian ini menunjukkan bahwa ada pengaruh signifikan* coping strategy, loneliness, *dan kualitas tidur terhadap gejala depresi pada mahasiswa selama pandemi Covid-19 sebesar 52.3%. Hasil uji hipotesis menunjukkan terdapat empat variabel memiliki pengaruh signifikan terhadap gejala depresi, yaitu* problem-focused coping, emotional loneliness, social loneliness, *dan kualitas tidur. Sementara* avoidant coping, emotion-focused coping, *dan* socially-supported *coping tidak memiliki pengaruh yang signifikan terhadap gejala depresi mahasiswa di masa pandemi Covid-19.*

***Kata kunci**: coping strategy, depresi, kualitas tidur, loneliness, mahasiswa, pandemi covid-19*

Introduction

Current dynamics and challenging times may affect an individual's mental state and lead to a mental disorder. One of the most common mental disorders is major depressive disorder. More than 300 million people worldwide are estimated to suffer from depression (World Health Organization, 2017). It has become very concerning after the Covid-19 pandemic hit all nations at the beginning of 2020. Since then, the depression cases seem to be significantly increased.

Covid-19 is an invisible global enemy. It affects not only humans' physical sides but also severely impacts mental health (Salari et al., 2020). Students are among the most vulnerable groups affected by this virus, especially regarding the depressive disorder. A number of other studies have shown an increase in cases of depressive symptoms among university students during the Covid-19 pandemic. Research conducted by Akhtarul Islam et al. (2020) reported that out of 476 students in Bangladesh, 84.4% of them experienced moderate to severe depressive symptoms during the Covid-19 pandemic, where students living in urban areas and living at home with their families showed higher levels of depressive symptoms. Another study by Kontantopoulou and Raikou (2020) also supports this, where out of 570 student participants who took the Beck Depression Scale test during quarantine showed 25% of them had severe depression and only 19.8% showed no signs of depressive disorder.

Furthermore, Son et al. (2020) found some stressors during a pandemic that could trigger depression among students. They fear and worry about physical health, difficulty concentrating at home, reduced social interaction, disturbances in eating and sleeping patterns, environmental changes, financial issues, increased academic burdens, and concerns about academic performance due to the online learning method. They also showed that the students who feel lonely, insecure, helpless or hopeless, overthinking, and worried about their academic performance are more prone to experiencing depression during the Covid-19 pandemic.

These negative impacts of depression cannot be underestimated. This is because it can lead to various maladaptive behaviors and disrupt academic productivity. Depressive symptoms in college students are closely related to suicidal behavior, use of drugs and alcohol, dropping out, anti-social behavior, and deviations from the maturation process at developmental stages (Wells et al., 1987). Besides the influence on academic productivity, depression can also affect other maladaptive behaviors that end in suicidal thoughts or behavior. Garlow et al. (2008) also revealed that 81 students who had suicidal ideation during the past month showed a higher mean score of depressive symptoms than those who did not.

Although several studies support an increase in depression among college students during the Covid-19 pandemic, there are differences from the results of a study conducted by Wang et al. (2020). They found that anxiety and depressive symptoms were relatively low among college students, but factors related to the Covid-19 pandemic may be associated with a higher increased risk of depressive symptoms. This is one of the bases for this research to find out what factors can influence depressive symptoms in college students, especially during this pandemic.

Many factors can influence the symptoms of depression. One thing that influences depressive symptoms is coping strategy. Coping strategy refers to an ability to overcome problems and avoid stressful situations. The choice of coping strategy can also affect the depression level (Tuasikal & Retnowati, 2019). Krisdianto and Mulyanti (2015) explained that coping mechanisms reflect an individual's anticipation of psychological problems, especially distress and depression. Better (adaptive) coping mechanisms contribute to a lower tendency to experience distress and depression. Individuals with an effective coping strategy or good adaptability to stress can direct it to positive stress, called eustress. On the other hand, A flawed coping strategy leads to negative stress called distress (Sarafino & Smith, 2011). Distress can trigger depression. Dumont and Provost (1999) also stated that protective factors such as social support and coping strategies owned by individuals can make their mental condition more unaffected by stressors than individuals who do not have it. In addition, Kar et al. (2020) emphasized that having an effective coping strategy for stressful situations, such as positive thinking, praying, trying to accept the problem at hand, and sharing feelings and telling stories with others can prevent individuals from experiencing stress-related mental disorders, such as depression. Therefore, an effective coping strategy should be promoted, which in turn functions as a protective factor against depression.

Another factor that can significantly affect depressive symptoms besides coping strategies is loneliness. This situation creates stress and exacerbates individual problems that can lead to depression. Cacioppo et al. (2006) stated that the relationship between loneliness and depressive symptoms is stable across various ages and ethnic groups. Another study on students in China also showed a positive relationship between depression and loneliness. Significantly, loneliness can predict depression (Ren et al., 2020). These findings are supported by a meta-analysis study by Erzen and Çikrikci (2018) on 88 studies that found a positive relationship between loneliness and depression.

Although the researches described previously explained the influence of the loneliness variable on depression, there are studies with contradictory results. As research conducted by Weeks et al. (1980) on 333 students who showed that there was no effect of loneliness on depression and vice versa. This makes us wonder and want to know whether the influence of loneliness variable on depressive symptoms really exists and is significant, especially for students.

The next factor that affects the symptoms of depression is sleep quality. It is a potential factor that influences the development and the emergence of depression. Clarke and Harvey (2012) added to the important role of sleep by mentioning insomnia as a factor that can predict the risk of depression. Several studies have shown evidence of a link between poor sleep quality and the occurrence of depressive disorders. It also causes poor academic performance, especially in college students (Abdussalam et al., 2013). In addition, Çelik et al. (2018) found that students with poor sleep quality experienced significantly higher depressive symptoms and were at risk of developing depressive symptoms 3.28 times higher than those having good sleep quality. Another research on 5,226 junior high school, seniro high school, and university students showed that there was a significant relationship that the worse the quality of sleep was, the higher the level of depressive symptoms displayed (Xu et al., 2012).

Although sleep disturbances are closely related to those experienced by individuals with depression, the fact is that sleep disturbances often precede recurrent and recurrent depression (Dobson & Dozois, 2008). Poor sleep quality can persist even though individuals with depressive disorders have successfully gone through therapy and antidepressants, so sleep disturbances that occur can increase the risk of a recurrence of these depressive disorders. Therefore, it is interesting to do research to further reveal the influence of sleep quality variables on depressive symptoms in college students.

All in all, previous findings on the relationship between each factor and the situation during the Covid-19 pandemic have led the researchers to conduct a study entitled "The Influence of Coping Strategy, Loneliness, and Sleep Quality on Student Depressive Symptoms during the Covid-19 Pandemic."

Methods

Participants

The research population is college students. The sample consisted of 203 active undergraduate students living in Jabodetabek (Jakarta, Bogor, Tangerang, Depok, Bekasi) attending online lectures during the Covid-19 pandemic.

Procedure

This research employed a non-probability sampling technique, specifically purposive sampling, to select participants because this sampling technique is often used when population is unknown and accessibility to the population is limited. Purposive sampling was used as the researchers set specific inclusion criteria for selecting respondents, that is, they must be undergraduate students in Jabodetabek who are currently undergoing online learning.

Measurement

The survey was comprised of several scales adapted or modified from the original scales; thus, the numbers of items in following scales may not be the same as in the original versions. The Beck Depression Inventory-II by Beck et al. (1996), which consisted of 20 items, was used for measuring depressive symptoms. The Brief COPE by Carver (1997) , which consisted of 26 items, measured four coping strategies: avoidant coping, emotion-focused coping, problem-focused coping, and socially-supported coping. The De Jong Gierveld Loneliness Scale by Gierveld and Kamphuis (1985), consisting of 11 items, measured two types of loneliness: emotional loneliness and social loneliness. Lastly, the Pittsburgh Sleep

Quality Index by Buysse et al. (1989), which consisted of 18 items measuring seven components of sleep quality (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction), was used for measuring overall sleep quality using aggregated scores.

Data Analysis

This research employed the Confirmatory Factor Analysis (CFA) method to analyze the validity test of each measuring instrument. It aims to check the unidimensional fit model and valuable items. CFA's results each variable can be concluded as follows:

Depressive Symptoms

In testing the construct validity of depressive symptoms, the researcher tested 20 existing items to find out whether these items were unidimensional, which means they only measured depressive symptom variables. From the initial results of CFA which was carried out using a one-factor model, the results did not fit with Chi square = 674.31, df = 170, P-value = .00000, RMSEA = .121. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 155.97, df = 129, P-value = .05309, RMSEA = .032. From the results of the fit model obtained it produces a P-value > .05 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely depressive symptoms.

Coping Strategy – Avoidant Coping

In testing the construct validity of avoidant coping, the researcher tested 6 existing items to find out whether these items were unidimensional, which means they only measure avoidant coping variables. From the initial results of CFA which was carried out with a one-factor model, the results showed that it did not fit with Chi square = 123.66, df = 9, P-value = .00000, RMSEA = .250. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 6.86, df = 5, P-value = .23164, RMSEA = .043. From the results of the fit model obtained it produces a P-value> .05 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely avoidant coping.

Coping Strategy – Emotion-Focused Coping

In testing the construct validity of emotion-focused coping, researchers tested 8 existing items to find out whether these items are unidimensional, which means they only measure emotion-focused coping variables. From the initial results of CFA which was carried out with a one-factor model, the results showed that it was not fit with Chi-square = 406.76, df = 20, P-value = .00000, RMSEA = .309. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 13.48, df = 11, P-value = .26320, RMSEA = .033. From the results of the fit model obtained, it produces a P-value> .05 67 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely emotion-focused coping.

Coping Strategy – Problem-Focused Coping

In the problem-focused coping construct validity test, the researcher tested the 6 existing items to find out whether these items were unidimensional, which means they only measured problem-focused coping variables. From the initial results of CFA which was carried out using a one-factor model, the results showed that it did not fit with Chi-square = 161.75, df = 9, P-value = .00000, RMSEA = .290. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 1.24, df = 4, P-value = .87166, RMSEA = .000. From the results of the fit model obtained it produces a P-value> .05 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely problem-focused coping.

Coping Strategy – Socially-Supported Coping

In testing the construct validity of socially-supported coping, the researcher tested 6 existing items to find out whether these items were unidimensional, which means they only measured socially-supported

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coping variables. From the initial results of CFA which was carried out using a one-factor model, the results were inconsistent with Chi-square = 106.75, df = 9, P-value = .00000, RMSEA = .232. Therefore, modifications to the model are carried out by eliminating measurement errors in items that are correlated with each other. After modification, the results obtained are fit with Chi-square = 8.53, df = 6, P-value = .20209, RMSEA = .046. From the results of the fit model obtained it produces a P-value> .05 70 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely socially-supported coping.

Loneliness – Emotional Loneliness

In testing the construct validity of emotional loneliness, the researcher tested 5 existing items to find out whether these items are unidimensional, which means they only measure emotional loneliness. From the initial results of CFA which was carried out with a one-factor model, the results showed that it did not fit with Chi-square = 20.95, df = 5, P-value = .00083, RMSEA = .126. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 2.20, df = 3, P-value = .53143, RMSEA = .000. From the results of the fit model obtained, it produces a P-value> .05 (not significant), which means that the model with one factor is accepted and all items are proven to only measure one factor, namely emotional loneliness.

Loneliness – Social Loneliness

In testing the construct validity of social loneliness, the researcher tested 6 existing items to find out whether these items are unidimensional, which means they only measure social loneliness. From the initial results of CFA which was carried out with a one-factor model, the results did not fit with Chi-square = 84.52, df = 9, P-value = .00000, RMSEA = .204. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 6.75, df = 5, P-value = .23991, RMSEA = .042. From the results of the fit model obtained it produces a P-value> .05 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely social loneliness.

Sleep Quality

In the sleep quality construct validity test, the researcher tested 15 existing items to find out whether these items were unidimensional, which means they only measured sleep quality variables. From the initial results of CFA which was carried out with a one-factor model, the results showed that it did not fit with Chi-square = 572.03, df = 90, P-value = .00000, RMSEA = .163. Therefore, modifications were made to the model by eliminating measurement errors in correlated items. After modification, the results obtained are fit with Chi-square = 65.65, df = 50, P-value = .06793, RMSEA = .039. From the results of the fit model obtained it produces a P-value> .05 (not significant) which means that the model with one factor is accepted and all items are proven to only measure one factor, namely sleep quality.

After valid items were confirmed via CFA, using accurate score estimation, the multiple regression analysis technique was used for examining the independent variable (IV) effect on the dependent variable (DV). This analysis method is carried out to see how much influence the independent variable (IV) effect on the dependent variable (DV).

Results and Discussion

Result

A multiple regression analysis was conducted to explore the effect of the independent variables on the dependent variable. Enter method was selected as a method for entering predictors. The first step is looking at the value of the coefficient of determination or R-square (R^2) to find out the proportion of the independent variable's influence on the dependent one. **Table 1.** shows the R-square value.

Table 1. R-*square*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723[a]	.523	.506	6.75261

Table 1. shows that the R-square value is .523 or 52.3%. It means the proportion of the variance of the depressive symptom variable explained by the coping strategy variables (avoidant coping, emotion-focused coping, problem-focused coping, and socially-supported coping), loneliness (emotional loneliness and social loneliness), and sleep quality is 52.3 %, while the other 47.7% is influenced by others beyond this study.

The second step is looking at the results of the F test to find out if the influence of the independent variable on the dependent one is significant or not. Table 2 presents the results of the F test.

Table 2. ANOVA Test of the Regression Model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9756.738	7	1393.820	30.568	.000
	Residual	8891.556	195	45.598		
	Total	18648.294	202			

Table 2. presents the significance level (p) in this study as .000 ($F(7,195) = 30.57$, $p < .05$). The requirement for a model to be significant is p <.05;thus, the null hypothesis is rejected, which indicates that the model with the independent variables significantly predict depressive symptoms during the Covid-19 pandemic.

The third step is looking at the value of the regression coefficient of each independent variable. Table 3. shows regression coefficient values for each research variable. Table 3. shows that four variables have significant regression coefficient values for depressive symptoms, namely: (1) problem-focused coping ($b = -.22$, $t(195) = -3.33$, $p = .001$), (2) emotional loneliness ($b = .24$, $t(195) = 3.37$, $p = .001$), (3) social loneliness ($b = .14$, $t(195) = 2.43$, $p = .016$), and (4) sleep quality ($b = -.39$, $t(195) = -6.87.33$, $p < .0005$).

Table 3. Regression Coefficients

	Unstandardized Coefficients B	S.E	Standardized Coefficients Beta	T	Sig.
(Constant)	34.182	8.597		3.976	.000
Avoidant Coping	-.072	.056	-.067	-1.285	.200
Emotion-Focused Coping	-.084	.066	-.081	-1.281	.202
Problem-Focused Coping	-.220	.066	-.213	-3.331	.001
Socially-Supported Coping	-.078	.074	-.077	-1.058	.292
Emotional Loneliness	.244	.072	.236	3.370	.001
Social Loneliness	.137	.056	.129	2.429	.016
Sleep Quality	-.389	.057	-.367	-6.868	.000

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Discussion

The Covid-19 pandemic is a difficult time for most people. One of its profound effects is the decline in individual mental health, especially regarding depressive situations. There are many aspects of the students' depression during the pandemic to study. One effort is to find out what factors influence it. Therefore, this research examined psychological factors that triggered the students' depressive symptoms during the Covid-19 pandemic.

The results of the hypothesis testing revealed that psychological factors in the form of avoidant coping strategy variables, emotion-focused coping, problem-focused coping, socially-supported coping, emotional loneliness, social loneliness, and sleep quality could significantly influence the depression symptoms of active student in Jabodetabek during the Covid-19 pandemic. However, according to the regression coefficients of each independent variable, of the seven existing independent variables, only four showed a statistically significant effect on depressive symptoms. The significant variables were problem-focused coping, emotional loneliness, social loneliness, and sleep quality.

The research findings showed that problem-focused coping had a negative regression coefficient direction. This means that higher problem-focused coping used by an individual led to a lower level of depressive symptoms. This result aligns with McNamara (in Dyson & Renk, 2006) that problem-focused coping was associated with decreased depression in individuals. Various stressful events during the Covid-19 pandemic have made effective coping behavior one of the important things that helps individuals deal with difficult situations, thereby preventing distress that can trigger depressive disorders. Individuals who can utilize existing resources, gather information, and have well-coping knowledge can help themselves deal with sources of stress directly (Yang, 2021).

For emotional loneliness, it had a positive regression coefficient direction, which indicated that a higher individual's emotional loneliness shows a higher level of depressive symptoms. This finding is similarly supported by Diehl et al. (2018), who found that the emotional loneliness score was directly proportional to the high level of depression in the students. This may be due to limited or restricted social interactions through the implementation of WFH (Work from Home) policy. This policy discourages on-site face-to-face communication with friends. Individuals who feel they have lost someone important, such as a relative or close friend, will experience a lack of attachment to others, leading to emotional loneliness within themselves (Drageset et al., 2012).

Next, social loneliness also significantly influenced depressive symptoms with a positive regression coefficient, meaning that the higher the individual's social loneliness was, the higher the individual's tendency to experience depression was. This is in line with Diehl et al. (2018), who explained that an increase in social loneliness scores would also trigger a higher level of depression in the students. Those students who rarely did physical activities outdoors get a higher social loneliness score than those who did not. Limited social interactions due to online lectures cause stronger social loneliness characterized by feelings of emptiness, longing for the presence of people around them, and rejection. If it remains like this, the feeling of loneliness can trigger symptoms of depression.

The following variable that significantly influenced the symptoms of depression is sleep quality. Sleep quality negatively directed the regression coefficient, in which lower sleep quality triggers higher depression symptoms. This finding aligns with Xu et al. (2012), who showed that a lousy individual's sleep quality meant a higher level of depressive symptoms. The WFH (Work from Home) policy implemented by the government during the pandemic has made individuals connect and involve electronic devices. Excessive exposure to digital screens such as television, laptop or computer, and cell phones can affect individual sleep, reducing sleep quality and increasing daytime sleepiness (Sinha et al., 2020).

Conclusion

The research findings conclude that coping strategies, loneliness, and sleep quality significantly influence the students' depressive symptoms during the Covid-19 pandemic with a significance value of < .0005. This research has also found that the overall contribution of independent variables (avoidant coping, emotion-focused coping, problem-focused coping, socially-supported coping, emotional loneliness, social loneliness, and quality of sleep) to the dependent one (depressive symptoms) had the R-

square value of 52.3%. In comparison, the other 47.7% was influenced by other variables outside of this research.

Based on the significance of the coefficient value of each independent variable, four variables significantly influenced depressive symptoms: problem-focused coping, emotional loneliness, social loneliness, and sleep quality. Meanwhile, the other three (avoidant, emotional-focused, and socially-supported coping) did not significantly affect depressive symptoms.

Also, this study has potential limitations that that may become a concern for further researchers. Where from the results of the study it was found that the proportion of the variance of all independent variables on depressive symptoms was 52.3%. This shows that 47.7% of the proportion of the variance of depressive symptoms is influenced by other variables. Therefore, the researchers suggest that future studies that wish to examine the topic of depression be able to examine variables other than those in this study, especially those related to the Covid-19 pandemic. For example, personality, stigma and social isolation. Furthermore, there are several variables that show insignificant results, namely avoidant coping, emotion-focused coping, and socially-supported coping. The researcher's failure to see the effect of these three variables can be an inspiration for further research to find out the causes of avoidant coping, emotion-focused coping, and socially-supported coping which do not have a significant effect on depressive symptoms. Last, with a small number of respondents and only around Jabodetabek (Jakarta, Bogor, Tangerang, Depok, Bekasi) it can be a suggestion for future researchers to replicate this research in a wider area so that they can more fully represent symptoms of depression in college students accurately. In addition, equalizing the number of male and female respondents can be done to be able to see a clearer comparison of the effect of gender on depressive symptoms.

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