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# Generalized Anxiety Disorder and Depression Among the Undergraduate Students Learning Online During the Covid-19 Pandemic: The Gender-Based Analysis

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## Abstract

This investigation attempts to verify the difference in generalized anxiety disorder and depression among undergraduate students learning online during the COVID-19 pandemic based on gender. Moreover, to accomplish this aim, this study utilizes 271 undergraduate students with batches 2015, 2016, 2017, 2018, 2019, 2020, and 2021 in the management department at the Business Faculty of Maranatha Christian University, Bandung, as the samples. The survey to obtain the students' data was from September until October 2021. Besides, the data are analyzed by the difference examination. After examining their response by independent samples t-test, this study demonstrates that females have higher generalized anxiety disorder and depression levels than males.

**Keywords:** Depression, Gender, Generalized Anxiety Disorder, The Covid-19 Pandemic, Virtual Learning

## 1. Introduction

At the start of 2020, all nations must fight against the coronavirus spreading from Wuhan, China (Danylyshyn, 2020). As the poorest effect, the persons infected by this virus died (Utari, 2020). This infection comes from droplets when the infected ones unintentionally cough, sneeze, and speak (World Health Organization, 2020). In Indonesia, to prevent the spread of this virus, the President of the Indonesian Republic, Joko Widodo, requires Indonesians to support social distancing by worshipping, working, and studying from home (Cahya, 2020).

Related to the study, during the pandemic, all higher education institutions in Indonesia must conduct virtual learning for students, as Circular Letter of the Minister of Education and Culture No. 36962/MPK.A/HK/2020 on

March 17, 2020 (Hasanah et al., 2020). Entering 2021, the Indonesian government started a vaccine program (Gandryani & Hadi, 2021). According to Budi Gunadi Sadikin, Minister of Health, it functioned to end the pandemic. In the educational field, lecturers and supporting personnel in higher education institutions become the target to be vaccinated after teachers and supporting personnel in early childhood, elementary, junior, and senior high schools (Widyawati, 2021).

This vaccination is prepared for the higher education institutions to hold a limited face-to-face meeting<sup>1</sup> in July 2021 with strict health protocol. This limitation means that the institutions must conduct blended learning, i.e., online and onsite combination, for the students (Azanella, 2021). Furthermore, to support online learning, the learning management system is vital (Yunus, 2021). Also, video conference platforms still become relevant, such as Zoom Meetings, Google Meet (Ekasari & Ahmad, 2022), and Microsoft Teams (Rojabi, 2020).

Generalized anxiety disorder becomes problematic when students learn online during the Covid-19 pandemic in Indonesia (Dinata et al., 2021; Hasanah et al., 2020). Through their research, Dinata et al. (2021) demonstrate that 44% of 166 students are particularly severe anxiety disorder. The rest are at average, mild, middle, and harmful levels: 11.4%, 6%, 22.3%, and 16.3%, respectively. Unlike Dinata et al. (2021), Hasanah et al. (2020) report that 41.58% of 190 students are in regular and mild levels, respectively. The rest, 16.84%, are at the medium level.

Also, when learning online, depression becomes an issue for students during the Covid-19 pandemic in Indonesia (Hasanah et al., 2020; Panjaitan & Suhartomi, 2022). Through their study, Hasanah et al. (2020) demonstrate that 96.32% of 190 students are at the average level, and the rest are at the mild level: 3.68%. In their study, Panjaitan and Suhartomi (2022) classify the students into two groups based on depression: the absent and available categories and the assessment of virtual learning: good and bad categories. After employing the cross-tabulation analysis based on the chi-square test, they effectively prove the relationship.

Furthermore, to differ this study from theirs, we investigate the difference in anxiety disorder based on gender by denoting Islam et al. (2020), Alshammari et al. (2022), Hakim et al. (2022), and Hamaideh et al. (2022), and depression based on gender by mentioning Islam et al. (2020), Lee and Jeong (2021), Azmi et al. (2022), Hamaideh et al. (2022), Ekasari and Ahmad (2022), and Pelucio et al. (2022). Moreover, to support our investigation, the undergraduate students in batches 2015, 2016, 2017, 2018, 2019, 2020, and 2021 in the management department in the business faculty of Maranatha Christian University, Bandung, based on the survey result from September until October 2021.

## 2. Literature Review

### 2.1. Generalized anxiety disorder based on gender

Generalized anxiety disorder (GAD) is a common mental health problem expressed by an unstable emotional tone (Adwas et al., 2019). Someone with this disorder will worry about several things, such as health, money, and family, without clear arguments (National Institute of Mental Health, 2022). According to Bandelow et al. (2017), this disorder has two symptoms. The first is somatic: tremors, palpitations, dizziness, nausea, and muscle tension. The second is psychic: the difficulty of concentrating, calming, sleeping, and comforting.

In their study, Islam et al. (2020), with 476 university students in Bangladesh as the samples, declare that males are more dominant than females at the different levels of GAD: minimal, mild, moderate, and severe. Alshammari et al. (2022), employing 418 students at King Saud University as the samples, locate that females are more anxious than males. By comparing the anxiety level of 60 medical students following the computer-based testing by their gender at Wijaya Kusuma university in Surabaya, Hakim et al. (2022) deduce that females are more worried than males. After investigating the gender-based anxiety disorder of 1,380 undergraduate students at Hashemite

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<sup>1</sup> This meeting has been allowed since the even semester of the academic year 2020/2021, usually started in February 2021, as informed by the Circular Letter of Director General of Higher Education No. 6/2020 (Azanella, 2021).

university in Jordan, Hamaideh et al. (2022) infer that the worrying level of females is greater than that of males. Based on the evidence, the first hypothesis is formulated like this:

H<sub>1</sub>: The generalized anxiety disorder of female students is more extensive than that of males.

## 2.2. Depression based on gender

Like anxiety disorder, depression is another mental health problem (Moy & Ng, 2021; Panjaitan & Suhartomi, 2022). It destructively influences personal feelings and the way of people for their thoughts and behaviors. Therefore, they will be pressured and not motivated anymore to do all the previously enjoyable things (Torres, 2020).

Once investigating the various levels of depression: none-minimal, mild, moderate, moderately severe, and severe, the investigation of Islam et al. (2020), utilizing 476 university students in Bangladesh as the samples, proves males are more foremost than females. In their research using teenagers aged between 15 and 18 in South Korea, Lee and Jeong (2021) exhibit that females are more depressed than males. Azmi et al. (2022) report a gender difference in depression: women are more depressed than men based on 157 investigated students learning online in Riyadh. Similarly, this evidence is confirmed by Hakim et al. (2022) after learning from the behavior of 60 undergraduate students in a medical department at Wijaya Kusuma university in Surabaya, Indonesia.

Through their study investigating the gender-based depression level of 1,380 undergraduate students at Hashemite university in Jordan, Hamaideh et al. (2022) infer that females are more depressed than males. Ekasari and Ahmad (2022), based on their study of the 344 students at the Alauddin Islamic state university in Makassar, demonstrate that the total number of women with all depression levels: average, mild, and, moderately and highly severe, is higher than that of men. Once studying 152 students learning in Rio de Janeiro, Pelucio et al. (2022) found that females have higher depression than males. Based on the evidence, the second hypothesis is formulated like this.

H<sub>2</sub>: The depression of female students is more extensive than males.

## 3. Research Method

### 3.1. Variable Measurement

This study quantifies anxiety disorder based on Dhira et al. (2021) and Alshammari et al. (2022) by seven items: I am panicky and anxious and not relaxed (GAD1), I cannot control my fears (GAD2), I am worried about various matters (GAD3), I cannot be tranquil (GAD4), I cannot easily rest (GAD5), I can get furious (GAD6), and afraid as if something terrible happens (GAD7). Besides, this study classifies the level based on Islam et al. (2020). The respondents do not have this symptom if the total score is below 5. If it is between 5 and 9, mild symptom exists. If it is between 10 and 14, moderate symptom occurs. If it is equal to 15 and above, severe symptom happens.

Besides, this study measures depression based on patient health with nine items employed by Huang et al. (2006): DEPR1 – DEPR9 (see Table 1) and determines the level by mentioning Sun et al. (2020) and Islam et al. (2020): If the total score is between 0 and 4: the depression is normal, 5 and 9: mild depression happens, 10 and 14: the moderate depression exists, 15 and 19: the depression is moderately severe, and 20 and above: severe depression happens.

Table 1: Patient health items to measure depression

Code	Item	Description
DEPR1	Anhedonia	I cannot feel pleasure
DEPR2	Depressed mood	I am unhappy.
DEPR3	Sleeping problem	I cannot sleep well.
DEPR4	Short strength	My strength decreases.
DEPR5	Appetite change	My eating pattern changes from too much to too little or the reverse.

Table 1: Patient health items to measure depression

Code	Item	Description
DEPR6	Low self-esteem	I am not virtuous because my family members are disappointed with me.
DEPR7	Concentration difficulties	I cannot concentrate easily.
DEPR8	Psychomotor agitation	I delay the work until late.
DEPR9	Suicidal ideation	I have the idea of killing myself.

Source: Huang et al. (2006)

### 3.2. Population and samples

The population of this study is the 843 undergraduate students in the management department among batches 2015, 2016, 2017, 2018, 2019, 2020, and 2021 in Maranatha Christian University. This research must calculate the representative sample (RS) for executing the simple random sampling method. Moreover, this study utilizes the Slovin formula with a 5% margin of error, as Suliyanto (2009) states, to fulfill it (see equation one).

$$RS = \frac{TP}{1+Ne^2} \quad (1)$$

By this formula, the representative samples (RS) intended are  $= \frac{843}{1+843(5\%)(5\%)} = \frac{843}{3.11} = 271$  students.

### 3.3. Method to collect data

This study surveys the students to collect the responses. Through this survey according to Hartono (2012), this study distributes the questionnaires to the respondents. Following Dhira et al. (2021) and Huang et al. (2006), the four-point Likert scale measures their response: Zero if they do not feel it, and three if they feel it.

### 3.4. Statistical method to analyze the responses

The involvement of the answer to the items needs validity and reliability examination. Therefore, this study uses confirmatory factor analysis consisting of loading factor, average variance extracted (AVE), and composite reliability coefficient, based on structural equation model (SEM) based on covariance, as Ghozali (2017) explains. Furthermore, the answer is accurate if the loading factor and AVE are higher than 0.5 (Ghozali, 2017). Meanwhile, reliable responses happen when this composite coefficient exceeds 0.7 (Sholihin & Ratmono, 2020).

As a consequence of the covariance-based SEM, the virtuousness of the fit model needs to be checked based on absolute fit measurements, such as CMIN/DF, root-mean-square error of approximation (RMSEA), and integrity of fit index (GFI). The required value is between two and five for CMIN/DF and from 0.05 to 0.08 for RMSEA. For GFI, the essential value should be 0.9 (Ghozali, 2017).

Finally, by considering the different groups based on gender associated with anxiety disorder and depression, this study utilizes the independent samples t-test, as Ghozali (2021) enlightens, for hypothesis testing. According to Hartono (2012), this test is classified as parametric; therefore, the related data, GAD and DEPR scores, need to follow the normal distribution. Moreover, this study utilizes Kolmogorov-Smirnov statistical test to prove it by denoting Ghozali (2021).

## 4. Result and Discussion

### 4.1. The student features in the survey

This survey was conducted from September until October 2021 and got 271 students as the participants. Moreover, they are classified based on batch, gender, age, the confirmation of being vaccinated, and various levels of generalized anxiety disorder and depression; their total is available in Table 2.

- The highest number of students is from batch 2021 (33.58%), the female group (50.18%), and the age group between 21 and 22 years old (43.91%).
- The lowest is from batch 2015 (1.48%), the male group (49.82%), and the age group between 17 and 18 years old (24.72%).
- The students receiving the Covid-19 vaccines dominate this survey, reflected by 60.89%. The rest do not receive it yet (39.11%).

Additionally, the total student with mild, moderate, and severe generalized anxiety disorder levels is 90, 80, and 45, with portions of 33.21%, 29.52%, and 16.61%, respectively. Meanwhile, 56 students without these symptoms exist (20.66%). For depression levels, the highest is from the students with mild indication: 79 (29.15%). The second, third, fourth, and fifth come from students with moderate: 77 (28.41%), moderately severe: 45 (16.61%), asymptomatic: 37 (13.65%), and severe: 33 (12.18%).

Table 2: The profile of students based on batch, gender, age, confirmation of getting vaccinated, and GAD and depression levels

Feature	Description	Total	Portion
Batch	2015	4	1.48%
	2016	6	2.21%
	2017	75	27.68%
	2018	26	9.59%
	2019	29	10.70%
	2020	40	14.76%
	2021	91	33.58%
Gender	Female	136	50.18%
	Male	135	49.82%
Age	17-18	67	24.72%
	19-20	85	31.37%
	21-22	119	43.91%
The confirmation of getting vaccinated	Received	165	60.89%
	Not received yet	106	39.11%
Generalized anxiety disorder level	None: 0-4	56	20.66%
	Mild: 5-9	90	33.21%
	Moderate: 10-14	80	29.52%
	Severe: 15 and above	45	16.61%
Depression level	None: 0-4	37	13.65%
	Mild: 5-9	79	29.15%
	Moderate: 10-14	77	28.41%
	Moderately severe: 15-19	45	16.61%
	Severe: 20 and above	33	12.18%

Source: Survey data

#### 4.2. The validity and reliability checking result

Panel A of Table 3 depicts covariance-based SEM's validity and reliability results. The items of generalized anxiety disorder, GAD1 until GAD7, have a loading factor higher than 0.5: 0.784, 0.761, 0.695, 0.538, 0.649, 0.701, and 0.821, and AVE greater than 0.5: 0.508. This situation demonstrates the accurate responses to these items. Also, these items have a composite reliability coefficient upper than 0.7: 0.877. Therefore, a reliable answer to them is attained.

Similarly, the loading factor of DEPR1 until DEPR9 is above 0.5: 0.785, 0.721, 0.657, 0.720, 0.758, 0.685, 0.707, 0.658, and 0.679, and AVE is beyond 0.5: 0.503 (see Panel A of Table 3). Consequently, the validity examination

is achieved. Besides, the composite reliability coefficient for these items is more than 0.7 0.901 (see Panel A of Table 3). Based on this condition, the answer is already consistent. Furthermore, Panel B of Table 3 demonstrates the goodness of fit detection, and satisfying results exist, reflected by CDMIN/DF between 2 and 5: 2.402, RMSEA between 0.05 and 0.8: 0.072, and GFI next to 0.9: 0.893.

Table 3: The result of validity and reliability and the detection of the goodness of fit

Panel A: Validity and reliability examination result		
Items	Loading factor	
	Anxiety disorder	Depression
GAD1	0.784	
GAD2	0.761	
GAD3	0.695	
GAD4	0.538	
GAD5	0.649	
GAD6	0.701	
GAD7	0.821	
DEPR1		0.785
DEPR2		0.721
DEPR3		0.657
DEPR4		0.720
DEPR5		0.758
DEPR6		0.685
DEPR7		0.707
DEPR8		0.658
DEPR9		0.679
AVE	0.508	0.503
Composite reliability coefficient	0.877	0.901
Panel B: The result of the goodness of fit model		
CMIN/DF	2.402	
RMSEA	0.072	
GFI	0.893	

Source: Modified Output of IBM SPSS AMOS 19

#### 4.3. The result of the preliminary parametric testing

As mentioned earlier, the normality test needs to be fulfilled to perform the difference in anxiety disorder and depression scores based on gender. Based on the Kolmogorov-Smirnov test, the asymptotic significance (2-tailed) for the GAD and DEPR scores is 0.133 and 0.065 (see Table 4). These values are beyond the 5% significance level; these scores follow the normal distribution.

Table 4: The normality test result

Research Variable	GAD	DEPR
N	271	271
Kolmogorov-Smirnov Z	1.163	1.308
Asymptotic Sig. (2-tailed)	0.133	0.065

Source: Modified Output of IBM SPSS 19

#### 4.4. The testing result of the difference in anxiety disorder and depression based on gender

Table 5 demonstrates that variances of GAD and DEPR for males and females are equal, as proven by the probability of the F-statistic of the Levene test above a 5% significance level: 0.362 and 0.215. Therefore, the

relevant t-statistic and its likelihood (2-tailed) for GAD based on gender are -2.375 and 0.018, and for gender-based DEPR, they are -2.796 and 0.006.

Related to the statistical examination result presented in Table 5, the average GAD of males (8.5556) is lower than that of females (10.0662), supported by the significant difference at 5%, reflected by the probability (1-tailed) of the t-statistic of 0.009 lower than 5%. Consequently, females have a higher anxiety disorder than males. Additionally, the average DEPR of females (12.5441) is higher than that of males (10.3630), supported by the significant difference at 5%, reflected by the probability (1-tailed) of the t-statistic of 0.006, lower than 5%. Thus, females have a higher depression than males.

Table 5: The testing result of the difference in anxiety disorder and depression based on gender

Description	Variances assumption	Test of Levene for equal variance		t-test for Equality of Means					
		F	Probability	Mean Difference	Std. Error Difference	t	df	Probability	
								2-tailed	1-tailed
GAD for males: 8.5556 and females: 10.0662	Equal variances assumed	0.833	0.362	-1.51062	0.63600	-2.375	269	0.018	0.009
	Unequal variances assumed	-	-	-1.51062	0.63588	-2.376	268.458	0.018	0.009
DEPR for males: 10.3630 and females: 12.5441	Equal variances assumed	1.547	0.215	-2.18115	0.78004	-2.796	269	0.006	0.003
	Unequal variances assumed	-	-	-2.18115	0.77988	-2.797	268.402	0.006	0.003

Source: Modified Output of IBM SPSS 19

#### 4.4. Discussion

The first hypothesis testing result demonstrates that the GAD level for females is higher than that for males: female students are more anxious than males. This circumstance occurs because women sensitively use their emotions; conversely, men tend to argue based on their logic (Hakim et al., 2022) and control their feelings well (Hosseini & Khazali, 2013). During the pandemic, students worry about infection, the uncertain future, the family financial crisis, and death (Dinata et al., 2021). Therefore, the proof from our hypothesis testing in this research is in line with Islam et al. (2020), Alshammari et al. (2022), Hakim et al. (2022), and Hamaideh et al. (2022).

The second hypothesis testing result demonstrates that the depression level of females is higher than that of males: female students are more depressed than males. According to Albert (2015), this situation exists because the female age is between 14 and 25, almost equal to the age range detected in this study: 17 to 22 (see Table 2). In learning, depression comes from the stress of following the class (Tuasikal & Retnowati, 2019), boring virtual learning, and the distress of facing exams (Azmi et al., 2022). Therefore, the result from our hypothesis testing in this research supports Islam et al. (2020), Lee and Jeong (2021), Azmi et al. (2022), Hakim et al. (2022), Hamaideh et al. (2022), Ekasari and Ahmad (2022), and Pelucio et al. (2022).

Moreover, to overcome the anxiety of female students, the lecturer needs to stimulate them to think positively about facing the negative effect of Covid-19 by stressing the vaccine's usefulness in decreasing the symptoms of Covid-19 and suggesting that students get vaccinated for whom have not received it yet. Furthermore, to reduce the depression level of all students, including females, the lecturer should create an exciting classroom by combining the materials delivered with funny videos or jokes, stimulating them to laugh. Outside the class, the



students with moderately severe and severe depression levels can consult with a counselor in counseling service in the directorate of students and alumnae at Maranatha Christian University.

## 5. Conclusion

This investigation aims to verify and analyze the gender difference in generalized anxiety disorder and depression. Furthermore, this study takes 271 undergraduate students of the management department at Maranatha Christian University virtually learned during the Covid-19 pandemic as samples. Based on the data testing of their responses, this research concludes that generalized anxiety disorder and depression in females are higher than in males. As the boundary, this study only examines gender as the determinant of generalized anxiety disorder and depression. This reality allows other scholars to study their related factors, for instance, age, sports, social roles, living status: with or without family, and living area.

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