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Prevalence and Factors Associated with Anxiety among Midwifery Students in Central Java Province during COVID-19 Pandemic

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Abstract
Introduction: The government has issued 'the adaptation to new habits' policy as there was a rapid increase in COVID-19 cases. This study aimed to assess the prevalence of anxiety and analyse the associated factors of anxiety among midwifery students.
Method: A cross-sectional study was conducted among midwifery students who are living and studying in Central Java Province from October 1 to October 25, 2020 using convenience sampling. The number of participants who met the criteria in the study was 1135. The online self-reported questionnaire was developed, which comprised of sociodemographic characteristics, health-related information, and anxiety using The Zung's Self-rating Anxiety Scale. Data were analysed using descriptive statistics and binary logistic regression analysis with p-value <0.05 as the cut-off point for significance.
Results: The prevalence of anxiety comprised of mild (9.7%), moderate (1.4%), and severe (1%), respectively. Exposure to a suspected case (OR = 2.3; 95% CI: 1.2, 4.6; p = 0.02) and age<20 years (OR = 0.4; 95% CI: 0.5, 0.9, p = 0.04) were significantly associated with anxiety. Students who were having contact with suspected COVID-19 had a 2.8 times greater risk of having anxiety. Students aged < 20 years had a 1.53 times greater risk of anxiety than those aged ≥ 20 years.
Conclusions*:* This study reveals that exposure to a suspected case and less than 20 years old were the risk factors of a higher anxiety levels among the midwifery students. Prevention and impact reduction intervention should be conducted.

Keywords: anxiety, COVID-19 pandemic, midwifery students, exposure, suspected case

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Introduction

Novel Corona Virus Disease (COVID-19) pandemic, which was the fifth pandemic after the 1918 flu pandemic, has rapidly spread worldwide. At the time of this writing, Indonesia had the highest number of confirmed cases in South East Asia countries, with 4,844,279 cases since the first cases were reported.[1] The Indonesian government issued numerous policies, including establishing the Task Force for Rapid Response to COVID-19, implementing Big Scale Social Restriction (PSBB)[2], enforcing adaptation of new habits towards COVID-19, monitoring guidelines for domestic travellers at

airports and seaports[3], launching risk-zone categories for COVID-19[4], developing health protocols in public spaces[5], and tightening discipline for prevention and mitigation during the outbreak[6].

The uncontrolled spread of the COVID-19 virus has impacted physical and psychological health.[7, 8] Students had no exception as the government closed all schools, including universities and colleges, and enforced online learning at home starting from March 2020. Several studies have shown the mental health impacts of COVID-19, particularly anxiety.[9-16] A study in the United States found that 71% of the students experienced stress and anxiety during the pandemic, influencing their sleeping habits, social interactions, and academic performance.[17] Another study in Bangladesh reported that more than two-thirds of university students suffered from anxiety (87.7%) at mild to severe depression (82.4%).[18] Those who were older[16,18], having contact with people who tested positive for COVID-19[19], having contact with a person with suspected COVID-19 or contaminating subjects, and the use of social media for accessing information about COVID-19[20] were significantly linked to an increased risk of COVID-19 related psychological problems.

During the pandemic, attending online classes and being isolated from friends made the process of learning more challenging. In addition, using protective equipment during clinical placements caused uncomfortable feeling for them.[29] These issues put the midwifery students at a greater risk for developing anxiety that may affect their academic life and future career. To our knowledge, there had been only few studies reporting anxiety and associated factors among midwifery students during COVID-19 pandemic. This study aimed to assess the anxiety prevalence and analyse the potential risk factors associated to anxiety among midwifery students in Central Java Province. The results of this study may provide some recommendations and guidance for the management of midwifery education during COVID-19 pandemic.

Methods

Study Population

A cross-sectional online study was conducted from October 1 to October 25, 2020, during COVID-19 pandemic among midwifery students in Central Java Province, Indonesia. Approximately 6382 midwifery students enrolled in 2019/2020 academic year in various institutions in Central Java Province. Convenient sampling was used in the study through the author's networks such as WhatsApp, by asking them to invite their friends to fill out the survey. Then, we forwarded messages to the head of midwifery study programs in Central Java and requested to share the link to their students. Finally, midwifery students were approached with the help of Facebook, Instagram, and Telegram. The sample size was calculated based on a 3% margin of error and 95% confidence interval; the required sample size was 915. However, this study reached 1135 participants, which was larger than needed. The inclusion criteria were the midwifery students studying and living in Central Java Province, having social media accounts such as WhatsApp, Instagram, Facebook, and Telegram and willing to participate in the study.

Instruments and Procedure

The online self-reported questionnaire was developed and sent to midwifery students in Central Java Province. The questionnaire was divided into three sections that covered 1) a brief introduction part of the study, purpose and voluntary participation, 2) sociodemographic characteristics of respondents (age, education, year of study, current staying status, type of learning activities, Covid-19 zone status, perceived health status (symptoms in the last week), exposure to a confirmed case, exposure to a person with COVID-19 symptoms, and acceptance of adapting new habits policy) and 3) anxiety during the adaptation of new habits towards COVID-19.

Anxiety during the adaptation of new habits of the COVID-19 pandemic was measured using the Indonesian version of Self Rating Anxiety Scale (SAS) and was based on a previous study (Cronbach's alpha 0.691).[21] The Zung Self-Rating Anxiety Scale (SAS) was a 20-item self-report item to measure anxiety symptoms with a total score ranging from 20 to 80.[22.] Each item was rated on a four-point Likert scale ranging from 4 to 1 (a little of the time, some of the time, good part of the time, and most of the time). Some items were scored on a 1-4 scale to avoid the problem of set response. The raw score was multiplied by 1.25 to produce an index score. An index score of 50 was used as the cut-off score for clinical significance in this study. The total of SAS index score was divided into ≤ 49 (normal), 50-59 (Mild), 60-69 (Moderate), and ≥ 70 (Severe).[23, 24] A pilot test was conducted in midwifery institutions in Yogyakarta Province that included 30 students completing the survey. The results of the pilot study were utilized to modify language and content to meet the aim required (Cronbach's Alpha 0.828).

Data Analysis

Data were analyzed with SPSS version 23. The statistical significance was set at 5%, with a P-value of < 0.05 in all tests. An analysis of descriptive statistics was used to describe sociodemographic characteristics and health-related information by providing means and frequency distribution of the participants (categorical variables). Quantitative measures of anxiety were converted into categorical anxiety groups using cut-off index scores. Students who had scored above 50 (index score) on the SAS questionnaire were considered to be in the anxiety level, while those who scored below were considered to be in the non-anxiety group.[24] Bivariate binary logistic regression analysis was used, and the variables with the p-value of <0.25 was considered as a candidate for a multivariate logistic regression model. In multivariate logistic regression, variables with p-value <0.05 were reported as statistically significant. The associations between risk factors and anxiety were presented as the odds ratio (OR) and a 95% confidence interval (CI).

Results

The sociodemographic characteristics and health-related information of the study are shown in table 1. Totally, 1418 students from 45 midwifery schools in Central Java Province completed the survey. Only 1135 participants were included in the data analysis, and 283 were excluded due to living outside Central Java province and duplication. About 54.4% of the participants were older than 20 years old. Most participants studied at the diploma level (76.7%), and 63.8% attended online classes. More than ninety percent of students had no contact with a confirmed or suspect to a person with COVID-19. Most of the participants agreed with the implementation of adapting new habits policy towards COVID-19 (88.3%). Further information about sociodemographic data and health-related data are shown in **Table 1**.

Level of anxiety during the COVID-19 pandemic

Table 2 shows the categories of anxiety levels among midwifery students during the COVID-19 pandemic in Central Java Province. Based on Zung's Anxiety Index, of the 1135 students, approximately 87.9% had no anxiety symptoms, whereas the prevalence of students with mild, moderate, and severe anxiety were 9.7%, 1.4%, and 1%, respectively.

Factors associated with students' anxiety during the COVID-19 pandemic

Significant variables from the univariate analyses that were significant at the 0.25 level (see **Table 3**) were entered into logistic regression analysis. Predictor variables like age, education, year of study, exposure to confirmed case, exposure to suspected case, and acceptance of the adaptation to new habits policy were identified as statistically significant. However, we excluded exposure to confirmed case to avoid a multi-collinearity.

Table 1. Descriptive statistics for sociodemographic characteristics, health-related information, October 2020 (n=1135)

Characteristics	N	%
Age		
< 20 years	517	45.5
≥ 20 years	618	54.4
Education		
Diploma	871	76.7
Bachelor and postgraduate	264	23.3
Length of study		
< 3 years	693	61.1
≥ 3 years	442	38.9
Type of learning		
Online	725	63.8
Offline	71	6.3
Online and offline	339	29.9
Currently staying with		
Living with friends or families	1118	98.5
Living alone	17	1.5
Zone status		
Green	226	19,9
Yellow	315	27,7
Orange	263	23.2
Red	331	29.2
Perceived health status (symptoms in the last two weeks)		
No	1120	98.7
Yes (more than two symptoms)	15	1.3
Exposure to a confirmed case		
No	1044	92.0
Yes	91	8.0
Exposure to a person with COVID-19 symptoms		
No	1072	94.4
Yes	63	5.6
Acceptance of the adaptation to new habits policy		
No	133	11.7
Yes	1002	88.3

Table 2. Anxiety levels during the COVID-19 pandemic among midwifery students in Central Java, October 2020 (n=1135)

Anxiety levels	**N**	**%**
Normal	998	87.9
Mild	110	9.7
Moderate	16	1.4
Severe	11	1.0
Total	1135	100.0

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Table 3. Sociodemographic characteristics and health related factors and psychological assessments of students with anxiety, October 2020 (n=1135)

Characteristics	Non-anxiety		Anxiety		OR	95% CI		P
	N	%	N	%		Lower	Upper	
Age								
< 20 years	443	39.0	74	6.5	0.68	0.48	0.97	0.03*
≥ 20 years	555	48.9	63	5.6				
Education								
Diploma	757	66.7	114	10.0	0.63	0.40	1.02	0.04*
Bachelor and postgraduate	241	21.2	23	2				
Year of study								
< 3 years	603	53.1	90	7.9	0.80	0.55	1.16	0.23*
≥ 3 years	395	34.8	47	4.1				
Type of learning								
Online	631	55.6	94	8.3	1.33	0.89	2.02	0.38
Offline	62	5.5	9	0.8				
Online and offline	305	26.9	34	3.0				
Currently staying with								
Living with friends of families	982	86.5	136	12	2.21	0.29	16.84	0.39
Living alone	16	1.4	1	0.1				
Zone status								
Green	198	17.4	28	2.5	0.94	0.57	1.58	0.78
Yellow	282	24.8	33	2.9				
Orange	230	20.3	33	2.9				
Red	288	25.4	43	3.8				
Perceived health status (symptoms in the last week)								
No	986	86.9	134	11.8	1.84	0.51	6.60	0.38
Yes (more than two symptoms)	12	1.1	3	0.3				
Exposure to a confirmed case								
No	925	81.5	119	10.5	1.91	1.1	3.3	0.02*
Yes	73	6.4	18	1.6				
Exposure to a suspected case								
No	951	83.8	121	10.7	2.68	1.47	4.87	0.00*
Table 3. Continued								
Yes	47	4.1	16	1.4				
Acceptance of the adaptation to new habits policy					0.61	0.38	1.00	0.04*
No	110	9.7	23	2.0				
Yes	888	78.2	114	10.0				

Table 4 showed the logistic regression analyses of associated factors with anxiety among midwifery students in Central Java Province during the COVID-19 pandemic. As presented in the table 4, exposure to suspected case (OR = 2.83, 95% CI = 1.55-5.12, p = 0.00) was significantly associated with anxiety. This means that students exposed to a suspected case were 2.83 times more likely to suffer from anxiety than those who had not been exposed to a suspected case. We also found that students aged < 20 years had 1.53 times greater risk of anxiety than those aged ≥ 20 years.

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Table 4. Logistic regression analyses on factors associated with anxiety, October 2020 (n=1135)

Variables	Anxiety				P-Value	Unadjusted ratio (95% CI)	Adjusted ratio (95% CI)
	Non anxiety		Anxiety				
	N	%	N	%			
Age					0.02	0.74 (0.46-1.19)	1.53 (1.07-2.2)
≥ 20 years	555	89.8%	63	10.2%			
< 20 years	443	85.7%	74	14.3%			
Exposure to a suspected case					0.00	2.79 (1.52-5.15)	2.83 (1.55-5.12)
No	951	83.8	121	10.7			
Yes	888	78.2	114	10.0			

Discussion

This study examined anxiety among midwifery students in Central Java province in October 2020, several months after the government announced the adaptation of new habits towards COVID-19 policy. We found that the prevalence of anxiety among midwifery students was 12.1%, with mild, moderate, and severe anxiety being 9.7%, 1.4%, and 1%, respectively. Compared to our findings, previous studies reported the higher prevalence of anxiety among university students in several countries including Ethiopia (27.7%)[9], Saudi Arabia (49%)[10], Bangladesh (44.59%) [18], US (30.6%) [14], France (27.5%) [11], Morocco (62.3%) [15], Malaysia (29.8%) [25], China (26.6%) [13] and Pakistan (41.3%)[12]. However, a study in China among 746.217 college students found that 11% of the students experienced anxiety[16] which was lower than our results. The possible reason for the difference in the anxiety's prevalence might be due to lockdown policies, different survey methods and measurements for anxiety, the time of data collection, and recruitment of students with various age groups.

The results of logistic regression analysis indicated that age was significantly associated to anxiety among midwifery students. These findings were consistent with the earlier studies. [16, 25-27] Previous studies among students in Malaysia and Bangladesh reported that older students had a higher level of anxiety than younger students.[18,27] In contrast, another study found that older Malaysian students had lower anxiety scores.[16] The pandemic has affected the use of social media for seeking more important information related to COVID-19 or sometimes broadcasting contradicting information which may trigger anxiety among young people.[25.]

One surprising finding was the association between exposure with a suspected case and anxiety; students who were exposed with a suspected person of COVID-19 had 2.83 times higher risk of developing anxiety compared to those who were not exposed with a suspected person of COVID-19. Bao et al. (2020)

stated that a surge in the number of infected and suspected individuals during the pandemic had elevated students' anxiety levels.[28] This finding may be related to the high contagiousness of COVID-19 that increases the fear of being infected by a person with unknown health status.

This study had some limitations. Firstly, this study was conducted cross-sectionally, carried out at Central Java province, which is only one province in Indonesia; therefore, it cannot be generalized for Indonesian midwifery students. Secondly, we used non-probability sampling methods that participants were selected based on accessibility and availability. Thirdly, this study relied upon online and self-reported questionnaires, which had a high chance of errors. However, we collected a large sample size (1,135 participants) that allowed us to conduct a robust study analysis. Also, data were collected during the adaptation of the new habits period, which offered a unique chance to investigate the mental health impacts of this period among students.

Conclusion

In conclusion, our findings added new evidence that older than 20 years old and exposure to the suspected case were the associated factors for developing anxiety during the adaptation of new habits towards COVID-19 among midwifery students. Therefore, these findings can provide insight for the government and policymakers to create strategies for addressing mental health problems among students and reducing the impact of associated factors of anxiety. In addition, further studies are needed to explore the causes of the anxiety and how to reduce the anxiety of students.

Ethics approval

This study was approved by the health research ethics committee of Dr. Moewardi General Hospital, Surakarta (approval no. 1.080/IX/HREC/2020). We conducted the survey with the agreement of participants who completed the survey. Participation in this study was voluntary, and the participants' information was kept confidential. We provided an informed consent before filling the questionnaire.

Availability of data and materials

Available

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Author Contribution

FAW designed and wrote the manuscript. WDA and YRA helped to check errors in grammatical and spelling aspects, TU analyzed the data, DW and NM collected sample and distributed the survey questionnaires.

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