

Prevalence of Mental Health Stress among Indonesian Islamic Boarding Schools Students in the Early Post-COVID-19: A Cross-Sectional Study

Hengky Irawan^{1*}, Yuni Asri², Dian Pitaloka Priasmoro³, Erik Irham Lutfi⁴

¹ Faculty Nursing and Midwife, Universitas STRADA Indonesia, Kediri, Indonesia

^{2,3} Department of Nursing, Faculty of Health Science, Institute of Technology Science and Health RS dr. Soepraoen Kesdam V/Brawijaya, Malang, Indonesia

⁴ Department of Nursing, Universitas Kadiri, Indonesia

*Corresponding author: habibstrada@gmail.com

ABSTRACT

Background: The COVID-19 pandemic has had a significant impact on students' mental health. However, little is known about its psychological effects on students in Indonesian Islamic boarding schools.

Purpose: This study aimed to determine the prevalence of stress among students in Islamic boarding schools and identify the associated contributing factors in the early post-pandemic period.

Methods: We conducted a cross-sectional study from March to April 2023 involving 425 students from four Islamic boarding schools in East Java, Indonesia. Participants were selected using a convenience sampling method. Data were collected using a structured questionnaire that included sociodemographic information and the Depression Anxiety Stress Scale-21 (DASS-21) to measure stress levels. Descriptive statistics and multivariate logistic regression analyses were performed to examine the association between stress and various factors.

Results: The findings showed that 30.64% of students experienced stress. Factors significantly associated with stress included female gender (OR: 2.17; 95% CI: 1.130–4.190; $p < 0.020$), length of stay of less than one year (OR: 0.43; 95% CI: 0.204–0.925; $p < 0.031$), dissatisfaction with allowance (OR, 2.81; 95% CI, 1.238–6.424; $p < 0.014$), poor communication with friends (OR: 3.60; 95% CI: 1.947–6.659; $p < 0.000$), and lack of social activities with peers (OR, 4.80; 95% CI, 1.415–16.28; $p < 0.012$).

Conclusion: This study highlights the need for targeted mental health interventions in Islamic boarding schools, particularly those that address financial satisfaction and social relationships. Strengthening peer communication and providing emotional support may help to reduce stress among students in post-pandemic settings.

Keywords: COVID-19, islamic boarding schools, mental health, prevalence, stress, students

Received March 14, 2025; Revised May 26, 2025; Accepted July 17, 2025

DOI: <https://doi.org/10.30994/jnp.v8i4.854>



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BACKGROUND

Coronavirus disease (COVID-19) was first identified in late 2019 (Chan et al., 2020), and was declared a global pandemic by the World Health Organization (WHO) in March 2020 (Wong et al., 2023), which spread rapidly across the globe, especially in significant continents such as Europe, America, and Asia. The pandemic has brought significant health consequences, especially in the health sectors, the economy, society, education, and psychology (Pfefferbaum & North, 2020; Radwan et al., 2021). The rapid outbreak of COVID-19 has significantly impacted economic growth (Gandasari & Dwidienawati, 2020), health (World Health, 2020), stress (Gritsenko et al., 2021; Javadekar et al., 2021; Romalina, 2021), and living conditions (Baker, 2020). The pandemic severely disrupted education and mental health worldwide, including among Indonesian students.

Due to the sudden closure of schools and other educational implications, the psychological status of the people is severely impacted during the pandemic (Radwan et al., 2021). Previous studies have shown that students are more likely to experience mental health problems, which include depression, anxiety, and stress. It has been reported that Malaysian (Wong et al., 2023), Palestinian (Radwan et al., 2021), Bangladeshi (Mehareen et al., 2021), Russian, and Belarusian (Gritsenko et al., 2021) university students develop high mental health stress. Further reports have shown that the mental and psychological health stress response during the COVID-19 pandemic in Indonesia significantly impacted the lifestyle of the students (Kaligis et al., 2020; Nuryana et al., 2022).

Several studies have reported on older adults' mental health status (Varin et al., 2020), and only a few studies reported on mental health among adolescents throughout COVID-19. Over time, as the pandemic progressed, attention gradually shifted toward other vulnerable groups, including adolescents. However, studies on adolescent mental health, particularly in specific cultural and religious contexts, are limited. In Indonesia, recent research has begun to explore this gap, notably among the young Muslim population of Yogyakarta. These studies revealed a significant prevalence of depression, anxiety, and stress among adolescents living in Islamic boarding schools, highlighting how the combination of pandemic-related disruptions and unique boarding school environments (Asri, 2023; Fidianingsih et al., 2023), particularly in Indonesia's Islamic boarding schools, where the research focuses on the influence of the teaching and learning process (Moh.Mahbub, 2020). According to their study, the young Muslim population in Yogyakarta, Indonesia, has a significant prevalence of depression, anxiety, and stress (ranging from mild to highly severe) (Asri, 2023; Moh.Mahbub, 2020). The research should make educational institutions, the government, and the general public more aware of the issue and prompt them to develop suitable preventive methods for psychological discomfort in the younger population (Fidianingsih et al., 2023). The Islamic boarding school is the earliest kind of Islamic education activity for acculturation to the local culture in Indonesia. It was created as a religious response from the local community (Hanafi et al., 2021). Since it is against the rules for students at Islamic boarding schools to bring cell phones, the lack of information could affect their mental health, and the effects of closing the Islamic boarding schools should take both physical and non-physical aspects. Additionally, Islamic boarding school students may experience mental health issues because of the pandemic's uncertainties.

OBJECTIVE

This study aimed the prevalence of stress among students in Islamic boarding schools and identify the associated contributing factors in the early post-pandemic period and identify associated factors connected with mental health stress.

METHODS

Study Design and Sampling Criteria

A descriptive-analytic cross-sectional study of 425 participating students studying at four (4) different Islamic boarding schools in East Java, Indonesia. Participants were recruited using convenience sampling from four Islamic boarding schools situated in Malang, Mojokerto, Jombang, and Bojonegoro in East Java, Indonesia (Asri, 2023; Asri & Chuang, 2023; Asri et al., 2024; Charan & Biswas, 2013; Wong et al., 2023). This non-probability sampling technique was selected because of movement limitations following the COVID -19 pandemic, and all students who were eligible and present during the data collection phase were invited to participate in the study.

Data Collection

The data collection used questionnaires to assess the participants' socio-demographics, stress-related factors, and stress. Socio-demographic variables included sex and education level. Stress-related factors collected include intention to reside within a boarding school, length of stay, frequency of family visits, satisfaction with their allowance, type of personality, communication with their friend, social activities with friends, satisfied living environment, health status, sleep need, wearing a mask during activities, using a tissue or the inner arm to cover the mouth while coughing, and keeping distance.

Outcome Variable

The outcome variable of this study was mental health stress, which was assessed using the short version of the Depression Anxiety Stress Scale-21 (DASS-21) (Lovibond & Lovibond, 1995; Osman et al., 2012), and the validity of the Indonesian version of DASS-21 was previously used in the Indonesian population (Asri, 2023; Asri et al., 2024; Ifdil et al., 2022; Kinanthi et al., 2020), and the scale of stress consisting of 7-items. Each item is scored on a 4-point Likert scale from zero (never) to 3 (almost always). Sum scores are calculated by multiplying the total number of scores for each subscale. An overall score was interpreted as usual (0 – 14) and stress (15 – 42).

Other Variables

Sex/gender was divided into male and female categories, and education levels were divided into primary and secondary. The intention to reside within a boarding school was divided into themselves and their parents. Length of stay was categorized into < 1 year and > 1 year. The frequency of family visits was classified as often, sometimes, and never. Satisfaction with allowance was measured using a single self-reported item that assessed the participants perceived adequacy of the financial allowance provided by their families for daily needs. Responses were categorized as “satisfied” or “unsatisfied”. This measure focuses on perceived sufficiency, rather than on specific monetary amounts or frequency. Personality type (extroverted or introverted) was assessed using a brief self-identification question based on general behavioral tendencies. At the same time, communication with friends was operationalized as the perceived quality of interpersonal interaction with peers, assessed using a self-rating scale with three options: good, average, or poor communication. Social activities with friends refer to the frequency and engagement in group-based social or recreational interactions with fellow students, such as joint study sessions or discussions. Participants reported whether their involvement was “good” or not good”. The satisfied living environment was categorized into satisfied, neutral, and unsatisfied. Health status was categorized into good and poor. Sleep need was categorized into good, adequate, and poor. Wearing a mask during activities was classified as yes and no. Likewise, using a tissue or the inner arm to cover the mouth while coughing was categorized into yes and no, and keeping distance was classified as yes or no.

Ethical Considerations

All participants and their legal guardians received a comprehensive explanation of the study aims, procedures, and confidentiality assurance. Before joining the study, written informed consent was obtained from both students (aged 12 years and above) and their parents or legal guardians. Participation was voluntary and participants were guaranteed that their responses would remain anonymous and confidential. The study was approved by the Ethics Committee of Politeknik Kesehatan Kemenkes Malang Komisi Etik Penelitian Kesehatan (approval number 088/III/KEPK POLKESMA/2023).

Statistical analysis

IBM SPSS Version 26.0 (IBM Corp.) was used to enter and analyze the data. Frequency and percentages were used to describe the socio-demographic characteristics of the participants, and a Chi-squared test was used to conduct a bivariate analysis of responder characteristics and depression. A multivariate logistic regression analysis was used to identify factors associated with mental health stress. An Odds Ratio (OR) and 95% Confidence Interval (CI) were generated for each variable in the final model.

RESULTS

Table 1 presents the socio-demographic distribution and the results of chi-square analysis. A total of 425 students from Islamic boarding schools participated in this study. Overall, more female participants (75.1%) participated in this study, giving a total of more than half of the participants (60.2%) had secondary high school, and most students (75.8%) intended to reside in a boarding school by themselves. In addition, most of the students lived in Islamic boarding schools for more than one year (82.6%). Only 4% had never visited their family, and most students (90.8%) were satisfied with their allowance. More than half of respondents (56%) had an introverted personality type, with 76.2% having good communication with friends. Among the students' social activities, 95.1% had suitable social activities with friends.

Furthermore, the living environment was deemed conducive and satisfactory by a significant majority of students (59.3%). A considerable proportion of these students (92.9%) reported good health status. Additionally, over half of the students (59.8%) indicated experiencing good sleep quality. However, the adoption of preventive measures was relatively low, with only 24.9% of students wearing masks consistently during activities, 37.6% using tissues or the inner arm to cover their mouths while coughing, and the same percentage maintaining proper physical distancing. Notably, within the realm of Islamic boarding schools, a significant portion (3069.64%) of students reported experiencing stress.

The chi-square test was applied to examine the statistical significance of the associations between the characteristics of the sample population and the prevalence of stress. The distribution based on sex/gender displayed statistically significant results ($p = 0.022^*$). Among males, 19.5% reported experiencing stress, while among females, 49.9% reported stress. The association between educational levels and stress was not statistically significant ($p = 0.175$). Within the primary education category, 26.1% of students reported stress, whereas 43.3% of students in the secondary education category experienced stress.

The intention to reside within a boarding school exhibited no statistically significant correlation with stress prevalence ($p = 0.177$). Among those who intended to stay within the school alone (53.9%) reported stress. While among those who intend to stay with their parents (15.5%) experienced stress. The length of stay within the boarding school showed a trend toward statistical significance ($p = 0.065$). Of those who stayed for less than a year, 13.6% reported stress, whereas for those with more than a year of stay (55.8%) reported

stress. The frequency of family visits yielded no statistically significant results concerning stress prevalence ($p = 0.805$). Stress was reported by 19.1% of those who often received family visits, 47.3% of those who received visits sometimes, and 3.15% of those who never received family visits. Furthermore, a strong and statistically significant correlation ($p = 0.000^*$) was observed between their allowance in terms of stress. Among those satisfied with their allowance, 65.6% reported stress, compared to 3.8% of those unsatisfied.

A significant association exists between student health status and sleep needs variables. Among students who reported good health status, 66.4% reported as mentally usual. However, 26.6% of those with good health status still experience stress. On the other hand, students with poor health status are relatively less (3.1%), but a more significant proportion (4.0%) report experiencing stress. This suggests that students with poor health status are more likely to experience stress, and this association is statistically significant ($p = 0.001$).

Furthermore, among students with good sleep needs, 46.4% are classified as mentally normal. However, 13.4% of them experience stress. Conversely, among students with adequate or poor sleep needs, the proportions reporting stress are notably higher (9.2% and 8.0%, respectively). This indicates that insufficient sleep or sleep dissatisfaction is significantly linked to higher stress levels among students, with a highly significant p -value ($p = 0.000$).

This study found that preventive measures such as wearing masks, practicing proper coughing etiquette and maintaining physical distance did not significantly correlate with stress levels and this were not deemed relevant predictors.

Table 1. Independent variables descriptive statistic with bivariate associations of stress among students (N = 425).

Variables	Frequency (%)	Mental Health Stress		<i>p-value</i>
		Normal (%)	Stress (%)	
Sex				0.022*
Male	106 (24.9%)	83 (19.5%)	23 (5.4%)	
Female	319 (75.1%)	212 (49.9%)	107 (25.2%)	
Educational level				0.175
Primary	169 (39.8%)	111 (26.1%)	58 (13.6%)	
Secondary	256 (60.2%)	184 (43.3%)	72 (16.9%)	
Intention to reside within a boarding school				0.177
Themselves	322 (75.8%)	229 (53.9%)	93 (21.9%)	
Parents	103 (24.2%)	66 (15.5%)	37 (8.7%)	
Length of stay				0.065
< 1 year	74 (17.4%)	58 (13.6%)	16 (3.8%)	
> 1 year	351 (82.6%)	237 (55.8%)	114 (26.8%)	
Frequency of family visits				0.805
Often	118 (27.8%)	81 (19.1%)	37 (8.7%)	
Sometimes	290 (68.2%)	201 (47.3%)	89 (20.9%)	
Never	17 (4.0%)	13 (3.215%)	4 (0.9%)	

Satisfied with their allowance				0.000*
Satisfied	386 (90.8%)	279 (65.6%)	107 (25.2%)	
Unsatisfied	39 (9.2%)	16 (3.8%)	23 (5.4%)	
Type of personality				0.901
Extrovert	185 (43.5%)	129 (30.4%)	56 (13.2%)	
Introvert	240 (56.5%)	166 (39.1%)	74 (17.4%)	
Communication with their friend				0.000*
Good	324 (76.2%)	254 (59.8%)	70 (16.5%)	
Average	89 (20.9%)	35 (8.2%)	54 (12.7%)	
Poor	12 (2.8%)	6 (1.4%)	6 (1.4%)	
Social activities with friends				0.000*
Good	404 (95.1%)	290 (68.2%)	114 (26.8%)	
Not Good	21 (4.9%)	5 (1.325)	16 (3.8%)	
Satisfied living environment				0.000*
Satisfied	252 (59.3%)	202 (47.5%)	50 (11.8%)	
Neutral	163 (38.4%)	88 (20.7%)	75 (17.6%)	
Unsatisfied	10(2.4%)	5 (1.2%)	5 (1.2%)	
Health Status				0.001*
Good	395 (92.9%)	282 (66.4%)	113 (26.6%)	
Poor	30 (7.1%)	13 (3.1%)	17 (4.0%)	
Sleep need				0.000*
Good	254 (59.8%)	197 (46.4%)	57 (13.4%)	
Adequate	102 (24.0%)	63 (14.8%)	39 (9.2%)	
Poor	69 (16.2%)	35 (8.2%)	34 (8.0%)	
Wearing a mask when doing activities				0.888
Yes	106 (24.9%)	73 (17.2%)	33(7.8%)	
No	319 (75.1%)	222 (52.2%)	97(22.8%)	
Using a tissue or the inner arm to cover the mouth while coughing				0.373
Yes	160 (37.6%)	222 (52.2%)	103 (24.2%)	
No	256 (62.4%)	73 (17.2%)	27 (6.4%)	
Keeping distance				0.842
Yes	106 (24.9%)	73 (17.2%)	31 (7.3%)	
No	319 (75.5%)	222 (52.2%)	99 (23.3%)	
Stress				
Normal	295 (69.4%)	-	-	

Stress	130 (30.6%)	-	-
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Note: * $p < 0.05$

Table 2 presents the outcomes of a multivariate logistic regression analysis that explores the connections between selected variables and stress levels among students within the Islamic boarding schools in Indonesia during the COVID-19 pandemic. The analysis reveals that several variables are significantly associated with stress levels, as indicated by the odds ratios (ORs) and their corresponding 95% confidence intervals (CIs). Female students had 2.17 times higher odds of experiencing stress than male students (OR: 2.17, 95% CI: 1.130 – 4.190). Thereby suggesting that being female increases the likelihood of reporting stress. Students unsatisfied with the allowance provided by their family had notably higher odds of experiencing stress, with an odds ratio of 2.81 (95% CI: 1.238 – 6.424), suggesting that financial dissatisfaction is associated with an elevated likelihood of stress.

As a critical factor in social activities in terms of communication with friends, students with average communication with their friends demonstrated 3.60 times higher odds of experiencing stress (OR: 3.60, 95% CI: 1.947 – 6.659), implying that students with communication difficulties or mediocrity may be more vulnerable to stress. Also, those not having suitable social activities with their friends exhibited significantly higher odds of experiencing stress, with an odds ratio of 4.80 (95% CI: 1.415 – 16.28). This highlights that a lack of positive social interactions can increase stress levels.

Nonetheless, students who had a length of stay within the boarding school for less than one year demonstrated lower odds of experiencing stress, with an odds ratio of 0.43 (95% CI: 0.204 – 0.925), which categorically suggests that a shorter duration of stay is associated with a reduced likelihood of stress. Other variables were found to show no statistically significant associations between stress levels and variables such as educational level, intention to reside within the boarding school, frequency of family visits, type of personality, satisfaction with the living environment, health status, sleep needs, wearing a mask during activities, using a tissue for coughing, and maintaining physical distance.

Table 2. Stress prediction by logistic regression among students ($N = 425$)

Variables	<i>p</i> -value	Odds Ratio (OR)	95% Confidence Interval (CI)
Sex	0.020		
Male		1.00	–
Female		2.17*	1.130 – 4.190
Educational level	0.212		
Primary		1.00	–
Secondary		0.71	0.422 – 1.211
Intention to reside within a boarding school	0.478		
Themselves		1.00	–
Parents		1.22	0.705 – 2.112
Length of stay	0.031		
< 1 year		1.00	–

> 1 year		0.43*	0.204 – 0.925
Frequency of family visits	0.401		
Often		1.00	–
Sometimes		0.79	0.462 – 1.350
Never		0.42	0.108 – 1.642
Satisfied with their allowance	0.014		
Satisfied		1.00	–
Unsatisfied		2.81*	1.238 – 6.424
Type of personality	0.874		
Extrovert		1.00	–
Introvert		0.96	0.594 – 1.556
Communication with their friend	0.000		
Good		1.00	–
Average		3.60*	1.947 – 6.659
Poor		1.07	0.227 – 5.104
Social activities with friends	0.012		
Good		1.00	–
Not Good		4.80*	1.415 – 16.28
Satisfied with the living environment	0.351		
Satisfied		1.00	–
Neutral		1.50	0.865 – 2.615
Unsatisfied		1.38	0.285 – 6.698
Health Status	0.117		
Good		1.00	–
Poor		2.33	0.809 – 6.715
Sleep need	0.783		
Good		1.00	–
Adequate		1.16	0.649 – 2.090
Poor		1.24	0.628 – 2.463
Wearing a mask during activities	0.623		
Yes		1.00	–
No		0.82	0.390 – 1.757
Using a tissue or the inner arm to cover the mouth while coughing	0.582		
Yes		1.00	–
No		0.84	0.452 – 1.561
Keeping distance	0.384		

Yes	1.00	–
No	1.41	0.646 – 3.105

Note: * $p < 0.05$

DISCUSSION

The research revealed that 30.6% of the students in Islamic Boarding Schools experienced stress shortly after the COVID-19 pandemic. This rate aligns with global studies on the student mental health during the period (Clabaugh et al., 2021; Wong et al., 2023), indicating that, while stress is a concern, the incidence among Indonesian Islamic boarding school students is not exceptionally high. However, this underscores the importance of ongoing monitoring and specific interventions in this distinct educational environment. The reasons behind this variance are unclear, and the factors speculated might not be universally applicable across all Islamic boarding schools. The circumstances of each school can significantly differ. Probable contributors to stress within these institutions following the pandemic include disrupted routines, isolation, and reduced social interactions. The outbreak may have disrupted essential religious practices, gatherings, and events. At the same time, the apprehension of virus transmission within tightly-knit communal environments could have escalated anxiety and stress among both students and staff.

Furthermore, the socio-demographic analysis illustrates significant differences in stress prevalence between genders, paralleling findings from a preceding study in Palestine (Radwan et al., 2021). Female students, in particular, often experience more significant stress than their male counterparts, potentially stemming from concerns about the impact of education and the pandemic on their well-being. Factors such as limited personal space may exacerbate stress for female students. In contrast, male students may possess more coping mechanisms, thus participating in stress-relieving activities that might be less accessible or less culturally accepted for female students within specific contexts. Although female students were more likely to report experiencing stress, it is crucial to note that the cross-sectional design of this study did not permit the establishment of causality. Therefore, we approached this association with caution. The relationship observed might indicate broader psychosocial or cultural factors that affect how female students perceive and report stress rather than suggesting a direct causal link.

It is noteworthy that while variables such as sleep requirements and health status were statistically significant in the bivariate analysis, they lost their significance in the multivariate regression. This change indicates possible confounding or overlapping effects with other variables in the model. For instance, maintaining communication with friends and engaging in social activities, both of which remained significant in the multivariate model, may mediate or overshadow the impact of sleep and overall health on perceived stress. These results highlight the complexity of mental health determinants and emphasize the importance of considering interactions among psychosocial variables when interpreting such findings.

Another significant finding was that students who spent more than a year at an Islamic boarding school had a notably lower likelihood of experiencing stress (OR: 0.43, $p = 0.031$), similar to a previous study in which students with less than one year of stay in an Islamic boarding school correlated with lower stress levels, akin to prior research. (Ouarasse & van de Vijver, 2005). Although this might initially seem to contradict studies indicating that prolonged institutionalization can heighten stress, it is plausible that an extended stay enables students to cultivate stronger coping strategies, adapt more effectively to a structured setting, and form meaningful friends. These elements may help reduce stress over time through acclimatization and enhance psychological resilience. Additionally, longer durations may

allow students to become more integrated into their school's support network, which can mitigate emotional distress.

The study also reveals that dissatisfaction with allowances and a lack of positive social activities with friends are linked to higher stress, which is consistent with earlier research (Milde-Busch et al., 2011; Ozbay et al., 2007); speculated reasons include reduced coping strategies and the inherent stress-relieving aspect of socializing and engaging in enjoyable activities with friends. Social interactions often distract students from academic pressures and personal concerns, allowing them to manage their stress better. The absence of such interactions may contribute to prolonged stress experiences.

Significantly, to the best of research findings, this study is the first in Indonesia to focus on stress levels among students in Islamic boarding schools during a pandemic. However, certain limitations should be addressed in future research endeavors, and careful consideration is required when interpreting the outcomes. The study's cross-sectional approach provides a snapshot of the situation but cannot definitively establish causal relationships over time. The convenience-based sampling method, employed due to movement restrictions, might restrict the generalizability of findings. Social desirability bias and concerns over stigma could lead to students underreporting or exaggerating their symptoms. Additionally, the questionnaires employed to assess stress and related factors might not comprehensively capture students' experiences, potentially impacting the accuracy of outcomes.

The results of this study have significant implication for mental health policies in schools. Initially, students who express dissatisfaction with their financial allowances might benefit from specific financial support strategies, such as subsidies or assistance based on needs, organized by school officials and families. Additionally, students who struggle with peer communication are more susceptible to stress and can gain from structured programs aimed at enhancing their social skills. These programs may emphasize emotional expression, peer interaction, and conflict resolution to build stronger interpersonal relationships. Such customized interventions are particularly vital in Islamic boarding schools where communal living and social harmony are essential for student well-being.

CONCLUSION

This study examined the prevalence and factors contributing to stress among students in Islamic boarding schools in Indonesia during the post-COVID-19 period. The results showed that 30.64% of students experienced stress, with several significantly associated factors, including female gender, length of stay, allowance satisfaction, communication with peers, and social activity participation. Among these, peer communication has emerged as the most significant factor associated with stress. Students who reported average or poor communication with their peers had considerably higher odds of experiencing stress. This finding suggests that the quality of social interaction plays a central role in students' psychological well-being, especially in the communal and socially structured environments of Islamic boarding schools. Effective communication likely serves as both a coping mechanism and buffer against isolation and emotional distress. These findings emphasize the need for tailored mental health programs that strengthen interpersonal skills and emotional support systems in boarding schools. Addressing communication barriers and fostering positive peer relationships may offer one of the most effective strategies for reducing student stress in similar institutional settings.

ACKNOWLEDGMENTS

The authors would like to thank all participants, Institut Teknologi Sains dan Kesehatan RS Dr. Soepraoen Malang, the head of the Islamic Boarding School in East Java, Indonesia.

COMPETING INTERESTS

The authors declare no conflict of interest related to the research, authorship, or publication of this article.

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