

Demographic and Contextual Predictors of Mental Health Outcomes among Indonesian Doctoral Students: A Cross-Sectional Study

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ABSTRACT

Doctoral students face unique academic, financial, and social pressures that increase their risk of mental health problems. While global data suggest high rates of depression, anxiety, and stress among Ph.D. candidates, no systematic investigation has been conducted in the Indonesian context. This cross-sectional study assessed the mental health of 245 Indonesian doctoral students using the Depression Anxiety Stress Scales-21 (DASS-21). Data were collected via an online questionnaire and analyzed using chi-square tests and multinomial logistic regression to identify demographic and contextual predictors of mental distress. Findings revealed high prevalence rates: 47.8% reported moderate to very severe depression, 59.2% reported anxiety, and 47.3% experienced stress—exceeding global averages. Gender was the strongest predictor; women were significantly more likely to experience all three symptoms ($p < .001$). Marital status and living arrangements were also significant, with married students and those living with family reporting better outcomes. Students employed while studying reported lower distress across all dimensions than full-time students. Field of study and stage of study were associated with mental health in bivariate analyses but lost significance in multivariate models, indicating confounding effects. The findings suggest that demographic and contextual factors such as gender, social support, and work-study balance significantly influence doctoral students' mental health. Given the high prevalence of distress, institutions should prioritize targeted support systems, especially for women and full-time students. This study provides essential baseline data for policy and intervention development in Indonesian higher education.

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1. INTRODUCTION

The prevalence of psychological problems among doctoral students has become a global concern. Studies from multiple countries consistently show alarming trends in doctoral students' mental health. In the United States, 68.1% of 387 psychology doctoral students reported daily functional impairment due to academic stress (El-Ghoroury et al., 2012). A larger survey of 2,279 higher education students, 90% of whom were doctoral candidates, found that they were six times more likely to experience anxiety and depression than the general population (Evans et al., 2018). In Europe, a Belgian study involving 3,659 doctoral students revealed that 51% were at risk of psychological distress (Levecque et al., 2017). Similarly, a study of 431 doctoral students in the UK found that 25% had low psychological well-being (Byrom et al., 2020). In Australia, doctoral students showed higher anxiety and depression levels than the general population, with longer study duration linked to worse outcomes (Barry et al., 2018). Moving to the Asian region, a Japanese study of 219 doctoral students reported that 53% experienced emotional disturbances, including anxiety, insomnia, depressive symptoms, and feelings of inadequacy (Pallos et al., 2005). These findings collectively suggest that mental-health difficulties among doctoral students occur consistently across global regions.

The causes of these problems are multifaceted. Doctoral education is one of the most demanding academic levels, characterized by intense intellectual challenges, long periods of independent work, and unstructured tasks (Sverdlik & Hall, 2020). Unlike earlier education, it requires a transition from dependency to independence and from student to professional identity (Laudel & Gläser, 2008). This transition often brings psychological strain. Doctoral students must balance high intellectual expectations with resilience in the face of constant evaluations, heavy workloads, strict deadlines, financial difficulties, publication pressures, and academic networking demands. (Schmidt & Umans, 2014; Kurtz-Costes, Andrews Helmke, & Ülkü-Steiner, 2006; Mays & Smith, 2009). These stressors shape a challenging environment that risks mental health. Doctoral education is a journey full of personal and interpersonal challenges (Brill et al., 2014; Mays & Smith, 2009; Pyhältö et al., 2012). The challenges start even earlier when they must develop a research question. This is a period of frustration, confusion, and anxiety that can affect their psychological state (Parsloe, 1993; Sverdlik et al., 2018). Unfortunately, most doctoral students are also not encouraged to manage their psychological well-being during their studies (Velardo & Elliott, 2018).

The urgency to research the mental health and well-being of doctoral students is related to many individual and global issues. A literature review by Schmidt & Hansson (2018) showed that mental well-being has a significant impact on doctoral students' research productivity and personal lives. When well-being is compromised, it affects the motivation and achievement of learning outcomes (Geraniou, 2010; Tanaka & Watanabe, 2012). Low levels of mental well-being have been found to be associated with increased dropout rates or delays in course completion (Anttila et al., 2015; Pyhältö et al., 2012). In addition, doctoral students who do not feel mentally well have the potential to engage in other activities to divert stress, which will hinder the study process (Scott & Takarangi, 2019). In contrast, doctoral students who are mentally well will have less risk of physical and psychological experiences and have a better quality of personal and social life. High well-being will also improve productivity and academic performance as well as the adjustment to campus life (Agteren et al., 2019). On the other hand, Levecque et al. (2017) highlighted three global effects of mental health problems in doctoral students. First, mental health problems in doctoral students will affect the quantity and quality of research results, which will hinder the development of science. Second, poor mental health will lead to inefficient spending at the research institutions where they study. Finally, higher attrition rates will pose a serious threat to the academic community and result in long-term consequences for national development.

Among studies on the mental health and well-being of doctoral students, information from the Asian region remains limited, especially in Indonesia. Indonesia has no comprehensive data on the mental health of doctoral students. There are problems, such as the dropout rate of 0.67% (2,495 students) from a total of 56,653. In addition, the average study period to complete the program reaches

5 years, which exceeds the study period in most doctoral study programs in Indonesia, which is 3–4 years (Direktorat Jenderal Pendidikan Tinggi, 2022). Meanwhile, the urgency of research on the mental well-being of doctoral students in Indonesia is increasingly urgent considering that the government's target to increase the number of doctorates has not been achieved optimally. The PMDSU (Master's Program Toward Doctorate for Excellent Graduates) program, launched by the government, has only reached 16% of the 20% target set. Even more concerning, the percentage of lecturers with doctoral degrees in Indonesia until 2022 only reached 1.60% of the total lecturers (Direktorat Jenderal Pendidikan Tinggi, 2022).

To conceptually anchor the variables examined in this study, the Job Demands–Resources (JD–R) model (Bakker & Demerouti, 2017; Demerouti et al., 2001) provides a strong theoretical foundation for understanding doctoral students' mental health. Doctoral training is widely characterized by substantial academic, temporal, financial, and role-related pressures, which align with the model's notion of demanding conditions that may heighten stress responses. At the same time, doctoral students differ in the extent to which they access personal, social, and structural resources—such as family support, supervisory guidance, employment stability, or living arrangements—that, according to the JD–R model, can buffer the negative effects of high demands. Because the JD–R framework accommodates both strain-inducing pressures and potentially protective resources, it offers a coherent basis for interpreting how variations in students' experiences and backgrounds may manifest in different mental-health outcomes. This makes the JD–R model particularly suitable for framing an exploratory examination of mental health among Indonesian doctoral students.

To date, no published empirical study has systematically examined the mental health of doctoral students in Indonesia, despite growing indications that their training conditions may expose them to high demands and uneven levels of support. Addressing this gap, the present study examines how depression, anxiety, and stress levels are distributed among Indonesian doctoral students and identifies the demographic and contextual factors that predict variations in these mental-health outcomes. This fresh perspective highlights the substantial implications of the research for Indonesia. Not only does the study contribute to addressing an empirical gap, it also has the potential to inform future studies and provide valuable insights into institutional and policy frameworks.

2. METHODS

This study employed a cross-sectional design with convenience sampling to reach Indonesian doctoral students. A total of 245 participants from public and private universities were recruited through surveys distributed via social media and direct contact. Data were collected using an online questionnaire (Google Forms) that included sociodemographic information and the Indonesian version of the Depression Anxiety Stress Scales-21 (DASS-21). The DASS-21 consists of 21 items across three seven-item subscales measuring depression, anxiety, and stress. Participants rated each item on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). The Indonesian adaptation has demonstrated strong psychometric properties across multiple validation studies (Hakim & Aristawati, 2023; Ifdil et al., 2020; Nada et al., 2022). In the current study, internal consistency reliability ranged from good to excellent across all subscales: depression (Cronbach's $\alpha = .95$), anxiety ($\alpha = .83$), and stress ($\alpha = .95$), confirming the measurement quality of the instrument in the present sample.

DASS outcomes were analysed using the validated categorical thresholds (normal, mild, moderate, severe, very severe) rather than continuous total scores to identify group-based risk patterns that reflect clinically meaningful distinctions in symptom severity. The categorical approach is widely recommended in surveillance and mental-health epidemiology, as it allows clearer interpretation of who falls within moderate-to-very severe risk levels. This method aligns with the normative guidelines of (Lovibond & Lovibond, 1995) and is appropriate when the analytical focus is on vulnerability profiles rather than mean score differences. Given the multi-category structure of the DASS severity outcomes,

multinomial logistic regression was employed as the most appropriate analytic strategy to model the probability of membership across the five severity levels.

All statistical analyses were conducted using IBM SPSS Statistics version 25. Prior to the main analysis, data screening was performed to assess data quality and verify statistical assumptions. Missing data analysis revealed no missing values across all variables ($N = 245$, 0% missing), eliminating the need for imputation procedures. No missing data were present in the dataset; therefore, no imputation procedures were required. Prior to running the multinomial logistic regression models, key assumptions were assessed. The independence of observations was ensured by the study design, and no issues of perfect separation were detected. Multicollinearity diagnostics showed acceptable levels (all variance inflation factors < 3), indicating that predictors were not excessively correlated. All categorical predictors had adequate cell counts across outcome categories, satisfying the requirement for sufficient data per response level. These checks indicated that the data met the assumptions necessary for multinomial logistic regression.

Table 1 presents the demographic characteristics of the 245 Indonesian doctoral students who participated in this study.

Table 1. Demographic characteristics of the participants ($n = 245$)

Aspects	Group	Number of Participants	Percentage (%)
Gender	Male	105	(42.9)
	Female	140	(57.1)
Age	26–30 years	10	(4.1)
	31–40 years	181	(73.9)
	>40 years	54	(22.0)
Marital Status	Married	197	(80.4)
	Not married	48	(19.6)
Residence	With family	182	(74.3)
	Away from family	63	(25.7)
Field of Study	Natural Science	69	(28.2)
	Social Science	176	(71.8)
Type of Program	By Research	128	(52.2)
	By Coursework	117	(47.8)
Year of Study	1 st years	40	(16.3)
	2 nd years	90	(36.7)
	3 rd years	82	(33.5)
	4 th years	30	(12.2)
	>4 th years	3	(1.2)
Funding	Scholarship	89	(36.3)
	Self-funded	156	(63.7)
Mode of Study	Full-time study	46	(18.8)
	Part-time (working)	199	(81.2)

A total of 245 doctoral students from different universities in Indonesia participated in the survey. More specific information regarding the participants is given in Table 1. Among all respondents, females made up 57.1% while males made up 42.9%. The largest cohort was aged 31–40 (73.9%), followed by those over 40 years old (22.0%), with a small proportion aged 26–30 (4.1%). In terms of marital status, most respondents were married (80.4%), with only 19.6% unmarried. A significant proportion of respondents (74.3%) reported that they lived with their families compared to 25.7% who lived away from family. Most (71.8%) participants were enrolled in the social sciences as compared to those (28.2%) enrolled in the natural sciences. Just over half (52.2%) were enrolled in research-based doctoral programs, while the rest (47.8%) were enrolled in coursework-based programs. Looking at the length of enrollment, the largest group was those who had been enrolled for 2 years (36.7%), followed by 3 years (33.5%), 1 year (16.3%), 4 years (12.2%), and over 4 years (1.2%). In terms of financial

sponsorship, 63.7% of the respondents self-funded themselves while 36.3% were scholarship recipients. Most respondents (81.2%) were employed while studying, compared to 18.8% who were full-time students not engaged in employment.

3. FINDINGS AND DISCUSSION

3.1 DASS Prevalence

Table 2. Distribution of Depression (N = 245)

Characteristics	Depression Severity, n (%) ^a					p	Cramer's V
	Normal	Mild	Moderate	Severe	Very Severe		
Gender						<.001***	.426
Male	59 (56.2)	6 (5.7)	38 (36.2)	1 (1.0)	1 (1.0)		
Female	27 (19.3)	10 (7.1)	73 (52.1)	21 (15.0)	9 (6.4)		
Age						0.739	.103
26-30	4 (40.0)	0 (0.0)	4 (40.0)	1 (10.0)	1 (10.0)		
31-40	65 (35.9)	12 (6.6)	78 (43.1)	19 (10.5)	7 (3.9)		
>40	17 (31.5)	4 (7.4)	29 (53.7)	2 (3.7)	2 (3.7)		
Marital Status						0.004	.356
Married	77 (39.1)	14 (7.1)	87 (44.2)	12 (6.1)	7 (3.6)		
Unmarried	9 (18.8)	2 (4.2)	24 (50.0)	10 (20.8)	3 (6.3)		
Residence						0.010	.433
With Family	71 (39.0)	13 (7.1)	81 (44.5)	10 (5.5)	7 (3.8)		
Away from Family	15 (23.8)	3 (4.8)	30 (47.6)	12 (19.0)	3 (4.8)		
Field of Study						0.001	.380
Natural Science	29 (42.0)	4 (5.8)	19 (27.5)	13 (18.8)	4 (5.8)		
Social Science	57 (32.4)	12 (6.8)	92 (52.3)	9 (5.1)	6 (3.4)		
Program Type						0.447	.123
Research	43 (33.6)	12 (9.4)	56 (43.8)	12 (9.4)	5 (3.9)		
Coursework	43 (36.8)	4 (3.4)	55 (47.0)	10 (8.5)	5 (4.3)		
Year in Program						0.103	.155
1 st	16 (40.0)	3 (7.5)	18 (45.0)	2 (5.0)	1 (2.5)		
2 nd	23 (25.6)	9 (10.0)	40 (44.4)	12 (13.3)	6 (6.7)		
3 rd	29 (35.4)	2 (2.4)	40 (48.8)	8 (9.8)	3 (3.7)		
4 th	17 (56.7)	1 (3.3)	12 (40.0)	0 (0.0)	0 (0.0)		
>4 th	1 (33.3)	1 (33.3)	1 (33.3)	0 (0.0)	0 (0.0)		
Funding						0.064	.191
Scholarship	23 (25.8)	9 (10.1)	42 (47.2)	9 (10.1)	6 (6.7)		
Self-Funding	63 (40.4)	7 (4.5)	69 (44.2)	13 (8.3)	4 (2.6)		
Mode of Study						0.017	.322
Full-time	60 (30.2)	13 (6.5)	97 (48.7)	20 (10.1)	9 (4.5)		
Working	26 (56.5)	3 (6.5)	14 (30.4)	2 (4.3)	1 (2.2)		

Note. ^aPercentages represent within-group proportions (row percentages). χ^2 = Chi-square test statistic. ***p < .001.

The analysis revealed several meaningful demographic patterns in the distribution of depressive symptoms. Gender emerged as the strongest differentiator, with a highly significant association ($p < .001$, $V = .426$). Female doctoral students showed markedly greater vulnerability, reflected in the substantial concentration of moderate symptoms (52.1%) and elevated proportions of severe and very severe depression compared with their male counterparts. Similar patterns of significance were observed for marital status ($p = .004$, $V = .356$) and residence ($p = .010$, $V = .433$). Unmarried students demonstrated greater psychological risk, particularly within the severe category, while students living away from family exhibited substantially higher levels of severe depression, highlighting the protective role of close relational and familial support during doctoral training. Field of study also showed a

statistically significant association ($p = .001$, $V = .380$), with social science students displaying higher proportions of severe and very severe symptoms than those in natural sciences, suggesting the presence of discipline-specific stressors. In addition, the mode of study was significantly related to depressive severity ($p = .017$, $V = .322$), with full-time students being more vulnerable than working students, likely due to the intensity of full immersion in doctoral demands.

In contrast, several variables did not demonstrate statistically meaningful differences. Age, program type, and year in program showed no significant associations, indicating relatively uniform levels of depressive symptoms across developmental and academic stages. Funding also did not reach statistical significance ($p = .064$, $V = .191$). Although scholarship recipients exhibited a slightly higher within-group concentration of moderate to very severe symptoms—suggesting possible pressures associated with performance requirements—the effect size was small and should be interpreted cautiously, as the funding source does not constitute a reliable differentiator of depression risk in this dataset.

Table 3. Distribution of Anxiety (N = 245)

Characteristics	Anxiety Severity, n (%) ^a					p	Cramer's V
	Normal	Mild	Moderate	Severe	Very Severe		
Gender						0.017	.520
Male	58 (55.2)	4 (3.8)	34 (32.4)	6 (5.7)	3 (2.9)		
Female	21 (15.0)	0 (0.0)	51 (36.4)	42 (30.0)	26 (18.6)		
Age						0.440	.125
26-30	4 (40.0)	0 (0.0)	4 (40.0)	1 (10.0)	1 (10.0)		
31-40	63 (34.8)	3 (1.7)	60 (33.1)	31 (17.1)	24 (13.3)		
>40	12 (23.1)	1 (1.9)	19 (36.5)	16 (30.8)	4 (7.7)		
Marital Status						0.025	.313
Married	70 (35.5)	4 (2.0)	70 (35.5)	33 (16.8)	20 (10.2)		
Unmarried	9 (18.8)	0 (0.0)	15 (31.3)	15 (31.3)	9 (18.8)		
Residence						0.048	.398
With Family	66 (36.3)	4 (2.2)	63 (34.6)	31 (17.0)	18 (9.9)		
Away from Family	13 (20.6)	0 (0.0)	22 (34.9)	17 (27.0)	11 (17.5)		
Field of Study						0.016	.323
Natural Science	29 (42.0)	0 (0.0)	14 (20.3)	18 (26.1)	8 (11.6)		
Social Science	50 (28.4)	4 (2.3)	71 (40.3)	30 (17.0)	21 (11.9)		
Program Type						0.643	.101
Research	43 (33.6)	1 (0.8)	42 (32.8)	28 (21.9)	14 (10.9)		
Coursework	36 (30.8)	3 (2.6)	43 (36.8)	20 (17.1)	15 (12.8)		
Year in Program						0.077	.158
1 st	15 (37.5)	2 (5.0)	15 (37.5)	2 (5.0)	6 (15.0)		
2 nd	22 (24.4)	1 (1.1)	32 (35.6)	21 (23.3)	14 (15.6)		
3 rd	25 (30.5)	1 (1.2)	29 (35.4)	22 (26.8)	5 (6.1)		
4 th	16 (53.3)	0 (0.0)	8 (26.7)	2 (6.7)	4 (13.3)		
>4 th	1 (33.3)	0 (0.0)	1 (33.3)	1 (33.3)	0 (0.0)		
Funding						0.040	.302
Scholarship	19 (21.3)	3 (3.4)	36 (40.4)	18 (20.2)	13 (14.6)		
Self-Funding	60 (38.5)	1 (0.6)	49 (31.4)	30 (19.2)	16 (10.3)		
Mode of Study						0.006	.342
Full-time	61 (30.7)	1 (0.5)	67 (33.7)	43 (21.6)	27 (13.6)		
Working	18 (39.1)	3 (6.5)	18 (39.1)	5 (10.9)	2 (4.3)		

Note. ^aPercentages represent within-group proportions (row percentages). χ^2 = Chi-square test statistic. *** $p < .001$.

The analysis of anxiety severity reveals several statistically meaningful demographic patterns. Gender shows a significant association ($p = .017$, $V = .520$), with female doctoral students demonstrating markedly higher vulnerability. Their within-group proportions in the severe (30.0%) and very severe (18.6%) categories are substantially higher than those of males, indicating a pronounced emotional

burden among women. Marital status also differentiates anxiety levels ($p = .025$, $V = .313$), where unmarried students exhibit higher concentrations of severe and very severe symptoms, suggesting that the absence of spousal support may heighten psychological strain. A similar pattern is observed for residence ($p = .048$, $V = .398$): students living away from family show considerably higher proportions of severe and very severe anxiety compared to those residing with family, emphasizing the protective role of proximal familial support. Field of study demonstrates another significant association ($p = .016$, $V = .323$), with social science students showing consistently elevated anxiety levels across moderate, severe, and very severe categories relative to those in natural sciences. Funding also reaches significance ($p = .040$, $V = .302$). Scholarship recipients display greater vulnerability, reflected in higher proportions of moderate (40.4%), severe (20.2%), and very severe (14.6%) anxiety compared to self-funding students. This pattern suggests that performance-based contractual expectations tied to scholarships may amplify anxiety, though the effect size remains moderate. Mode of study further distinguishes anxiety severity ($p = .006$, $V = .342$), with full-time students showing higher proportions of severe and very severe anxiety than working students—likely reflecting the intensified academic immersion associated with full-time enrolment. Conversely, several variables—age, program type, and year in program—do not show statistically significant differences in anxiety severity, indicating that anxiety levels remain relatively consistent across age groups, academic tracks, and stages of doctoral progression.

Table 4. Distribution of Stress (N = 245)

Characteristics	Stress Severity, n (%) ^a					p	Cramer's V
	Normal	Mild	Moderate	Severe	Very Severe		
Gender						<.001***	.454
Male	82 (78.1)	7 (6.7)	13 (12.4)	3 (2.9)	0 (0.0)		
Female	49 (35.0)	13 (9.3)	38 (27.1)	30 (21.4)	10 (7.1)		
Age						0.193	.128
26-30	8 (80.0)	0 (0.0)	0 (0.0)	1 (10.0)	1 (10.0)		
31-40	97 (53.6)	14 (7.7)	35 (19.3)	26 (14.4)	9 (5.0)		
>40	25 (48.1)	6 (11.1)	16 (29.6)	6 (11.1)	0 (0.0)		
Marital Status						0.006	.342
Married	113 (57.4)	18 (9.1)	39 (19.8)	22 (11.2)	5 (2.5)		
Unmarried	18 (37.5)	2 (4.2)	12 (25.0)	11 (22.9)	5 (10.4)		
Residence						0.030	.309
With Family	105 (57.7)	17 (9.3)	35 (19.2)	20 (11.0)	5 (2.7)		
Away from Family	26 (41.3)	3 (4.8)	16 (25.4)	13 (20.6)	5 (7.9)		
Field of Study						0.001	.373
Natural Science	37 (53.6)	3 (4.3)	7 (10.1)	17 (24.6)	5 (7.2)		
Social Science	94 (53.4)	17 (9.7)	44 (25.0)	16 (9.1)	5 (2.8)		
Program Type						0.200	.156
Research	61 (47.7)	11 (8.6)	30 (23.4)	22 (17.2)	4 (3.1)		
Coursework	70 (59.8)	9 (7.7)	21 (17.9)	11 (9.4)	6 (5.1)		
Year in Program						0.050	.164
1 st	27 (67.5)	2 (5.0)	3 (7.5)	5 (12.5)	3 (7.5)		
2 nd	36 (40.0)	11 (12.2)	21 (23.3)	17 (18.9)	5 (5.6)		
3 rd	49 (59.8)	3 (3.7)	18 (22.0)	10 (12.2)	2 (2.4)		
4 th	18 (60.0)	4 (13.3)	7 (23.3)	1 (3.3)	0 (0.0)		
>4 th	1 (33.3)	0 (0.0)	2 (66.7)	0 (0.0)	0 (0.0)		
Funding						0.022	.316
Scholarship	38 (42.7)	13 (14.6)	19 (21.3)	15 (16.9)	4 (4.5)		
Self-Funding	93 (59.6)	7 (4.5)	32 (20.5)	18 (11.5)	6 (3.8)		
Mode of Study						0.095	.180
Full-time	101 (50.8)	14 (7.0)	47 (23.6)	28 (14.1)	9 (4.5)		
Working	30 (65.2)	6 (13.0)	4 (8.7)	5 (10.9)	1 (2.2)		

Note. ^aPercentages represent within-group proportions (row percentages). χ^2 = Chi-square test statistic. *** $p < .001$.

The distribution of stress severity reveals several significant demographic patterns. Gender again emerges as the strongest differentiator ($p < .001$, $V = .454$), with female doctoral students showing substantially greater vulnerability. Their within-group proportions in the moderate (27.1%), severe (21.4%), and very severe (7.1%) categories are markedly higher than those observed among males, indicating an elevated stress load among women during doctoral training. Marital status also demonstrates a significant association ($p = .006$, $V = .342$); unmarried students show considerably higher proportions in both severe and very severe stress compared with married students, reinforcing the buffering role of spousal support. Residence status presents a similar pattern ($p = .030$, $V = .309$), where students living away from family exhibit more severe stress levels, highlighting the importance of proximal familial support in reducing psychological strain. Field of study is another significant factor ($p = .001$, $V = .373$). Social science students display higher proportions of moderate to very severe stress relative to natural science students, suggesting discipline-specific pressures that may intensify stress responses. Funding also reaches significance ($p = .022$, $V = .316$). Scholarship recipients show a higher concentration of moderate, severe, and very severe stress symptoms compared with self-funding students, implying that performance-based expectations attached to scholarships may heighten stress, although the effect remains moderate. Additionally, year in program approaches significance ($p = .050$, $V = .164$), with second-year students exhibiting notably elevated levels of severe stress, potentially reflecting the transition into heavier research demands. In contrast, age, program type, and mode of study do not show statistically meaningful associations, indicating that stress levels are relatively consistent across age groups, academic tracks, and study modes.

To complement the tabular distributions and facilitate a clearer visual understanding of group-based patterns, figure 1–3 provide a consolidated visual summary of all DASS severity levels across the key demographic variables examined in this study.

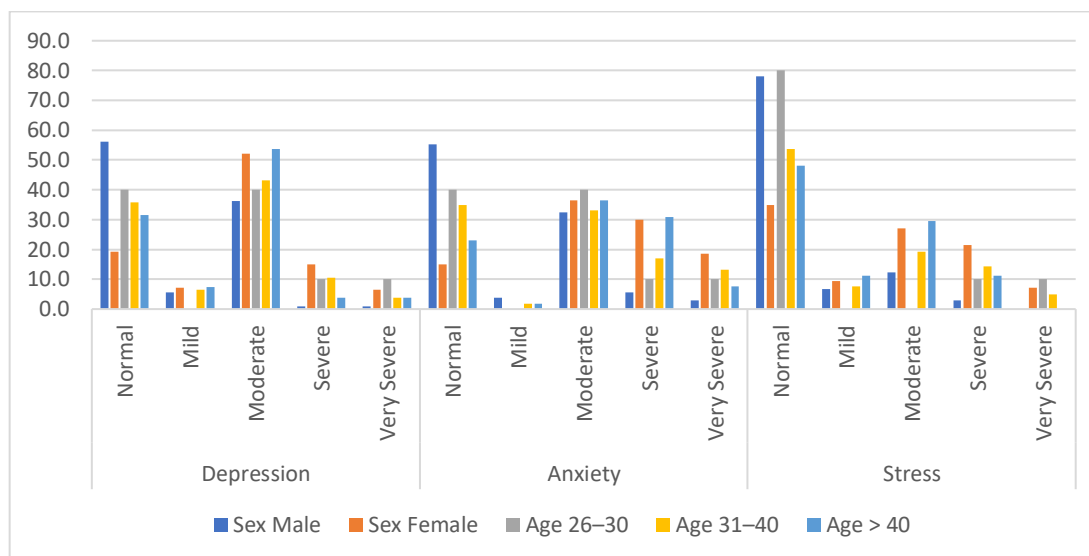


Figure 1. Distribution of DASS severity levels stratified by gender and age

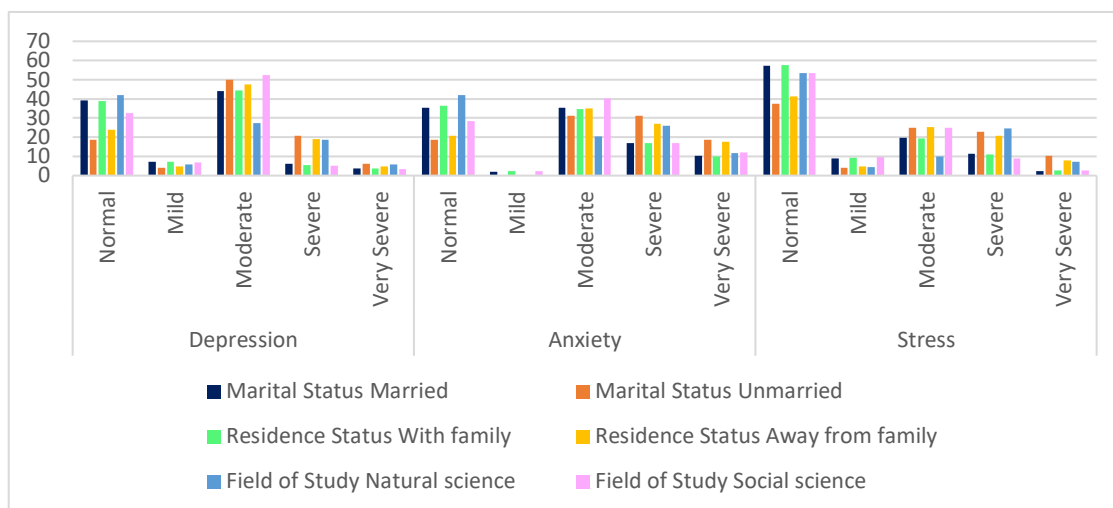


Figure 2. Distribution of DASS severity levels stratified by marital status, residence status, and field of study

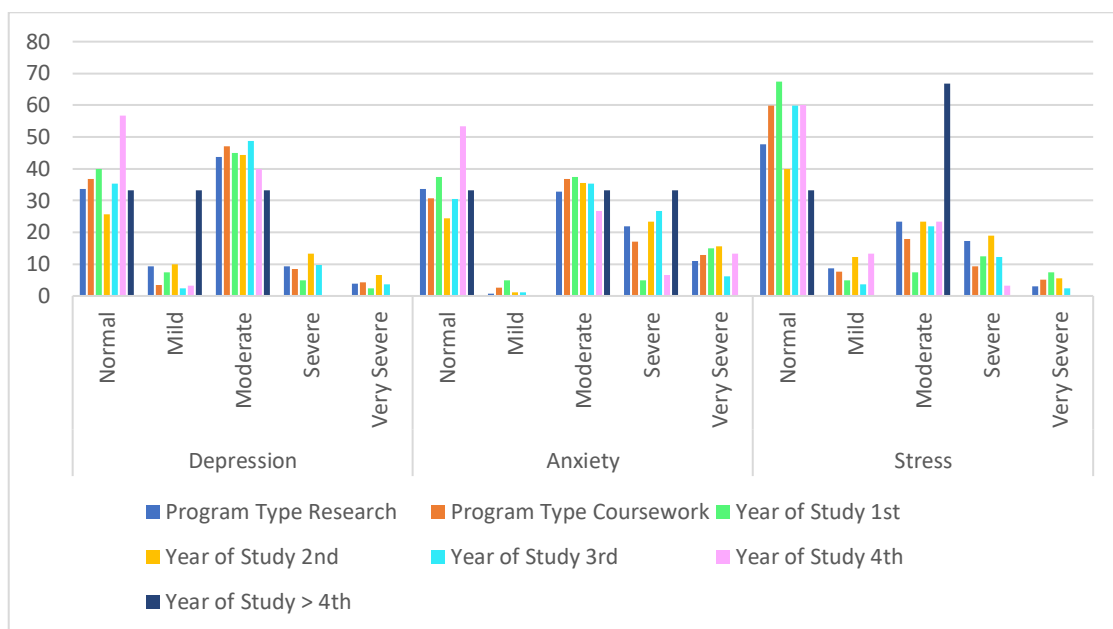


Figure 3. Distribution of DASS severity levels stratified by program type and year of study

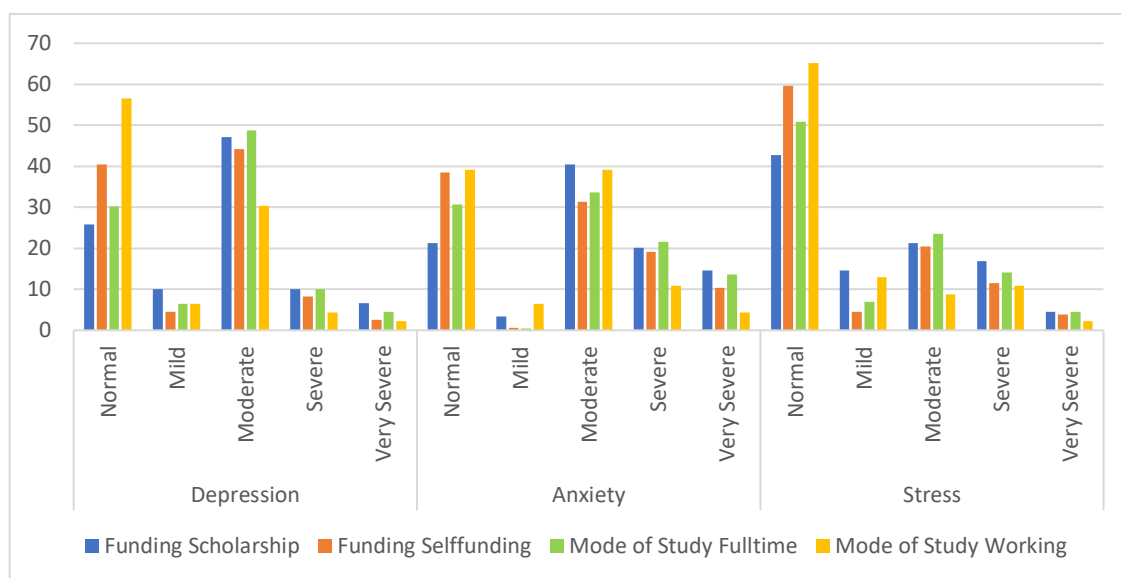


Figure 4. Distribution of DASS severity levels stratified by funding and mode of study

3.2 Multinomial Logistic Regression

Table 5. Multinomial logistic regression of DASS (n =245)

Predictor	Depression Score			Anxiety Score			Stress Score		
	Wald χ^2	df	p-value	Wald χ^2	df	p-value	Wald χ^2	df	p-value
Sex	64.908	1	< .001	69.980	1	< .001	58.490	1	< .001
Age	1.313	2	.519	1.193	2	.551	.602	2	.740
Marital Status	4.447	1	.035	2.497	1	.114	2.851	1	.091
Residence Status	1.478	1	.224	1.581	1	.209	3.029	1	.082
Field of Study	.753	1	.385	4.919	1	.027	.029	1	.866
Type of Program	1.941	1	.164	2.561	1	.110	.201	1	.654
Year	14.373	4	.006	14.686	4	.005	13.724	4	.008
Funding	1.557	1	.212	.613	1	.434	.576	1	.448
Mode of Study	19.251	1	< .001	13.806	1	< .001	4.900	1	.027

The multinomial logistic regression model demonstrated acceptable fit, with a Nagelkerke R² of .375, Cox and Snell R² of .371, and McFadden R² of .105, indicating that the included demographic and contextual predictors provided a meaningful improvement over the null model.

The multinomial logistic regression analysis identified sex, marital status, and mode of study as significant predictors of doctoral students' psychological distress. Specifically, sex showed a strong effect across all domains—depression ($\chi^2 = 64.908, p < .001$), anxiety ($\chi^2 = 69.980, p < .001$), and stress ($\chi^2 = 58.490, p < .001$)—indicating notable gender-based differences in mental health outcomes. Marital status significantly predicted depression ($\chi^2 = 4.447, p = .035$) but was not associated with anxiety or stress. Meanwhile, mode of study (full-time versus working) was also a significant predictor across all three indicators, depression ($\chi^2 = 19.251, p < .001$), anxiety ($\chi^2 = 13.806, p < .001$), and stress ($\chi^2 = 4.900, p = .027$). Other variables, including age, residence, field of study, type of program, year, and funding, were not statistically significant (all $p > .05$), indicating limited independent effects on psychological distress among doctoral students.

A comparison between the bivariate chi-square results (Tables 2–4) and the multinomial logistic regression findings (Table 5) reveals several notable discrepancies that underscore the distinct analytical purposes of each method. In the bivariate analyses, demographic variables such as marital status, residence, field of study, funding, and mode of study demonstrated significant associations with

depression, anxiety, and stress. These patterns suggest that psychological distress appears unevenly distributed across demographic groups when each factor is examined in isolation. However, many of these variables lost significance in the multinomial regression models once all predictors were entered simultaneously. This shift indicates that several bivariate associations were likely confounded by overlapping demographic characteristics. For example, residence status and funding—initially significant in bivariate tests—were rendered non-significant in the multivariate models, suggesting that their apparent influence was explained by other covariates such as gender, year in program, or mode of study. Conversely, variables such as year in program, which showed weak or inconsistent associations in the bivariate tables, emerged as strong and consistent predictors of all three DASS outcomes in the multinomial models. This pattern is indicative of a suppression effect, wherein the true predictive value of a variable becomes evident only when shared variance with other correlated predictors is statistically controlled.

These divergences are not contradictory but rather reflect the fundamental differences between the two analytical approaches. Chi-square tests assess raw associations without adjusting for confounding factors, making them sensitive to group imbalances, unequal cell sizes, and demographic clustering typical of doctoral student populations. In contrast, multinomial logistic regression estimates the unique contribution of each predictor by modelling all variables simultaneously while accounting for the full distribution of severity categories. As a result, the multinomial model offers a more refined and accurate depiction of demographic risk, revealing that gender, mode of study, and academic progression are the most robust and independent predictors of depression, anxiety, and stress. By contrast, factors such as marital status, residence, funding, and field of study appear to exert only contextual or indirect influences that dissipate once adjustment is applied. Together, these findings highlight the importance of moving beyond simple bivariate comparisons toward multivariate modeling when examining complex mental-health outcomes, as the latter more accurately captures the interplay of demographic factors shaping psychological distress in doctoral students. A visual overview of these relationships is presented in Figure 5.

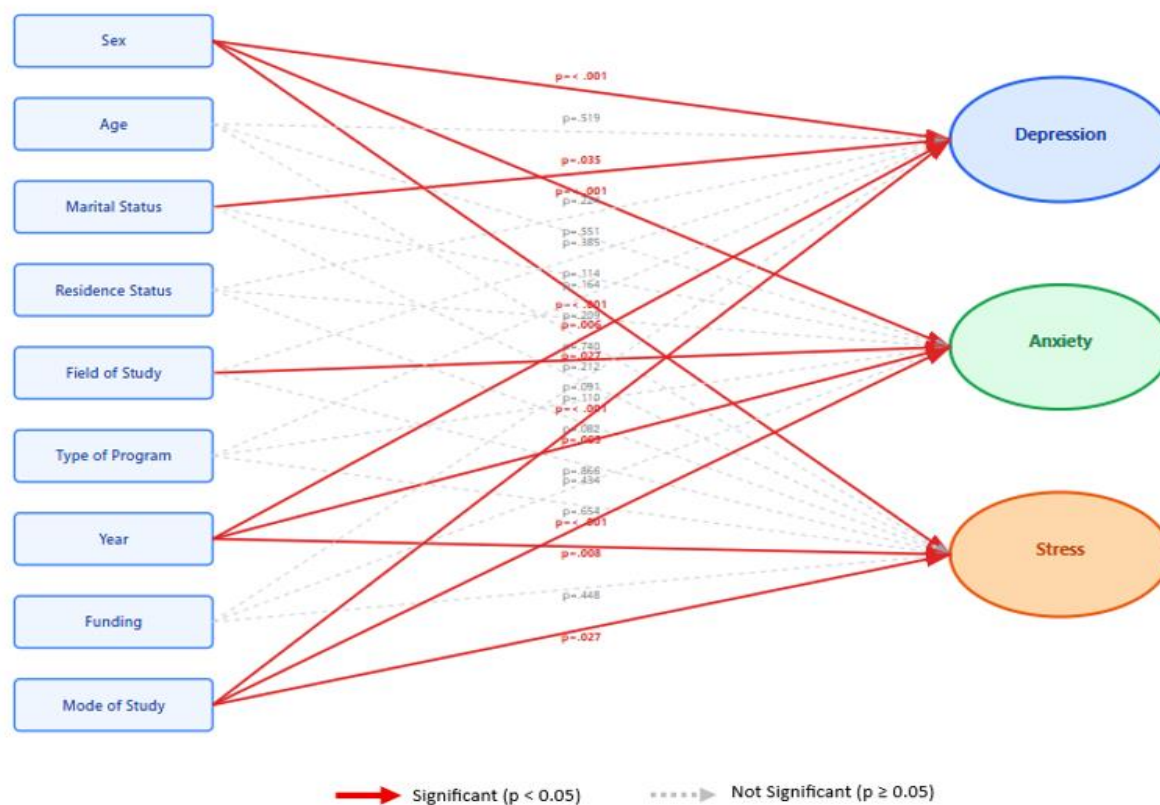


Figure 5. Multinomial Regression of DASS

3.3 Mental Health Prevalence

This study highlights the seriousness of mental distress and its prevalence among Indonesian doctoral students. Almost half of the participants (47.8%) met the threshold for at least moderate depression, while anxiety and stress were present in 59.2% and 47.3% of participants, respectively. Globally, it is well documented that 20-50% of graduate students exhibit symptoms of either depression or anxiety during their course of study, with rates up to six-fold compared to the general population (Evans et al., 2018). This study suggests that Indonesian doctoral students might, in fact, display much higher levels of anxiety compared to peers from other countries. This assertion is underscored by the startling 59.2% prevalence of moderate to severe anxiety symptoms reported. These findings indicate that the increasing complexity of challenges associated with attaining a doctorate causes exceptionally high levels of mental distress among this population. Moreover, the breakdown of the DASS-21 severity categories indicates that a considerable minority of respondents displayed symptoms within the moderate and above category: 12.3 % for depression, 27.8% for anxiety, and 14.3% for stress. These numbers indicate people whose symptoms are very likely exacerbating difficulties in daily life activities and scholarly work. This highlights the concerning need for precise mental health strategies in doctoral studies. Unfortunately, limited empirical evidence regarding mental health challenges among doctoral students in Indonesia constrains efforts to comprehensively understand and systematically address these concerns.

3.4 Gender Differences

The most notable pattern in this study is the consistently higher levels of depression, anxiety, and stress reported by female doctoral students compared with their male counterparts. This gender-based difference is consistent with previous research showing that female graduate students tend to report greater psychosocial strain than males. For example (Syed Wahid et al., 2023) found that female students at MARA University of Technology reported substantially higher anxiety and depression scores, with a considerable proportion falling within the “extremely severe” category. Prior literature suggests several contextual and sociocultural conditions that are frequently associated with elevated distress among women in academic settings, including experiences of gender bias, impostor feelings, work–life conflict, and differential socialization patterns pattern (Schmidt & Hansson, 2018). In the Indonesian context, cultural and familial expectations — particularly for married women — may coincide with academic responsibilities in ways that increase subjective strain (Kholis, 2017). Additionally, evidence indicates that women are generally more likely to acknowledge and report internalizing symptoms, which may contribute to their higher self-reported levels of distress (Mackenzie et al., 2006).

3.5 Role of Social Support

Another important pattern observed in this study concerns the association between social support and the mental health profiles of doctoral students. Unmarried students living alone reported higher levels of depression, anxiety, and stress compared with those who were married or lived with family, suggesting that the presence of close social networks may coincide with more favorable psychological outcomes during the doctoral journey. Prior literature similarly notes that, within the intense and often isolating context of doctoral study, greater access to emotional or practical support tends to be *associated with* lower levels of distress (Cornwall et al., 2019; Waight & Giordano, 2018). In Indonesia’s collectivist cultural setting, family involvement is frequently described as influential, as it often coincides with more stable emotional, practical, and financial conditions that are linked to reduced daily strain (Putri et al., 2021). Family support has also been *reported in the literature* as correlating with lower feelings of inadequacy and depressive symptoms among doctoral students (Walsh et al., 2023; Xu et al., 2024). Nonetheless, contrasting findings from Ren et al. (2024) indicate that family environments may, in some circumstances, be associated with elevated depressive symptoms, highlighting the need to examine not only the presence but also the quality of family relationships in future research.

3.6 Work-Study Balance

One of the most intriguing findings of this study concerns the relationship between employment status and mental health outcomes. Contrary to common assumptions about the burden of combining work with doctoral studies, students who engaged in employment alongside their academic pursuits demonstrated lower levels of depression, anxiety, and stress compared to full-time students. These findings challenge conventional wisdom and suggest that external work may provide important psychological benefits, including financial security, diverse social interactions, and a sense of practical application of skills. In this context, students who are employed may experience a sense of economic agency that buffers them from financial stressors commonly associated with doctoral study. Moreover, work environments can offer a contrast to the often-isolating academic culture, providing students with social integration, identity reinforcement, and opportunities for skill application, which are all known contributors to psychological well-being (Cornér et al., 2017; Janta et al., 2014). Research indicates that positive factors such as social support, departmental social climate, and optimism about their career prospects are protective against depressive symptoms in graduate students (Charles et al., 2022), and part-time work may contribute to each of these elements. This finding, like others, requires careful consideration. The nature of the positive impact of work can vary depending on the type of work, working hours, and the level of inflexibility offered by the job and academic program. Meanwhile, part-time or flexible work is more likely to improve well-being, but overly demanding work can pose risks to mental well-being and academic achievement.

3.7. Unexpected Finding

Although several demographic characteristics emerged as significant predictors of depression, anxiety, and stress, a number of expected relationships did not materialize. Notably, age and year in program showed no significant associations across all three mental-health outcomes, despite prior evidence suggesting that early-stage doctoral students often experience elevated stress during the transition into independent research (Sverdlik & Hall, 2020). One plausible explanation is that psychological distress in the Indonesian doctoral context is shaped less by academic seniority and more by structural and sociocultural pressures that persist throughout the entire program—for example, funding insecurity, publication requirements, and expectations of rapid completion. These pressures may produce a uniformly high level of strain, reducing variability between student cohorts. Similarly, program type (research vs. coursework) and field of study did not reach statistical significance in the final models, contradicting findings from Western studies that report discipline-specific stressors (Barry et al., 2018). This pattern may reflect the relatively homogeneous institutional expectations placed on doctoral candidates in Indonesia, where performance benchmarks, dissertation timelines, and supervisory practices tend to follow similar structures across departments. The absence of significant effects for these variables highlights the need to examine system-level determinants—such as institutional climate, supervisory quality, and workload demands—that may overshadow the influence of individual demographic characteristics. These nonsignificant results also underscore the importance of expanding future research beyond demographic predictors toward more proximal psychological and contextual processes, including coping strategies, perceived support, and academic self-efficacy.

4. CONCLUSION

This study provides an initial empirical overview of Indonesian doctoral students' mental health, showing that although multiple demographic factors were linked to psychological distress in bivariate analyses, only gender, marital status, and mode of study remained significant predictors in multinomial regression. These findings point to the need for gender-responsive policies and targeted institutional support, particularly for women and students living away from their families. However, the study's cross-sectional design, convenience sampling, and uneven disciplinary and geographical

representation limit causal inference and generalizability. Future research should employ longitudinal and mixed-method approaches, explore cultural mechanisms such as family support and employment demands, and consider incorporating additional variables such as academic culture, supervisory relationship quality, and mental health literacy to deepen the understanding of distress patterns. Institutions and policymakers are encouraged to develop structured psychological support systems, ranging from counseling services and peer mentoring to supervisor training, to foster a more supportive academic environment and strengthen doctoral student well-being and success in Indonesia.

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