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Development and rasch validation of the student mental health scale among indonesian university students

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Abstract

Mental health among university students is a critical issue that affects academic performance, quality of life, and overall well-being. This study aims to develop and validate the Student Mental Health Scale (SMHS), a culturally contextualized instrument to assess mental health status among Indonesian university students. Utilizing a quantitative, cross-sectional design, data were gathered from students across nine faculties at Universitas Pendidikan Indonesia. The Rasch Model was employed for data analysis, offering precise and objective insights into mental health distributions. Results indicated that 19.8% of students demonstrated healthy mental status, while 59.5% showed moderate mental health concerns, and 20.6% exhibited poor mental health. These findings suggest that approximately 80% of university students require mental health support, highlighting the critical need for comprehensive campus-based interventions. Key stressors include academic pressures, social dynamics, and financial burdens, with female students showing higher vulnerability. Effective interventions, such as peer support programs and resilience training, are critical. The study underscores the critical distinction between universal mental health instruments and culturally adapted tools, highlighting how the SMHS fills a significant gap by providing contextually appropriate assessment that existing international scales cannot adequately address in Indonesian university settings. The findings hold significant implications for mental health interventions and institutional strategies in higher education.

Keywords: *mental health, university students, risk factors, preventive measures, rasch model.*

Introduction

Mental health is a crucial component of individual well-being, especially for university students who navigate complex academic and social pressures. Higher education institutions are responsible not only for academic development but also for supporting students' mental and emotional growth (Watson et al., 2017). However, reality often shows that the university environment can become a source of stress for students, potentially compromising their mental health (Dermawati et al., 2023). Adapting to a new environment, academic pressures, social demands, and family expectations are among the factors that can trigger stress, anxiety, and even depression among students. This strain may lead to academic burnout, negatively impacting their quality of life and capacity for optimal academic performance.

Mental health is commonly defined as a state in which an individual is free from symptoms of mental disorders. A mentally healthy individual can function normally in life, particularly when adjusting to challenges by effectively managing stress (Putri, Wibbawa, & Gutama, 2015). According to Pieper and Uden (2006), mental health refers to a state where individuals experience no self-blame, have realistic self-estimations, accept their weaknesses, handle life's challenges effectively, find satisfaction in social life, and attain happiness. Although this framework offers valuable insight, it is derived from Western contexts and may not fully reflect the cultural realities of Indonesian students, whose experiences are shaped by different values, norms, and stressors. As Yusuf (2018) affirms, mental health is essential to achieving a balanced and fulfilling life, which requires contextual understanding and culturally grounded support mechanisms.

The underlying issue for this study is the high prevalence of mental health problems among university students, which often remain undetected or inadequately addressed (Zhang, Peng, & Chen, 2024). Many students in Indonesia lack access to proper mental health services or appropriate screening tools that are culturally tailored to their lived realities. The absence of culturally relevant mental health instruments hinders effective early detection and targeted intervention strategies (Bruffaerts et al., 2019). Recent reviews emphasise the need for mental health tools that are not only valid but also contextually sensitive to the socio-cultural realities of university students in developing countries (Tran et al., 2023).

To date, no mental health assessment instruments have been culturally validated specifically for Indonesian university students. This represents a significant gap in the field, particularly given mounting evidence from international research highlighting the critical importance of culturally adapted mental health instruments. Studies across diverse populations have consistently demonstrated that generic mental health scales often fail to capture culture-specific manifestations of psychological distress and well-being (Kessler et al., 2010; Ryder et al., 2011). Research in Asian contexts specifically has shown that Western-derived instruments may miss culturally relevant symptoms while overemphasizing others that are less salient in local populations (Chong et al., 2012; Lim et al., 2018).

Furthermore, emerging evidence from university student populations worldwide underscores the urgent need for population-specific assessment tools. Recent studies have revealed that traditional mental health instruments inadequately address the unique stressors and psychological experiences of contemporary university students, including academic pressure,

social media influences, career uncertainty, and identity formation challenges (Stallman, 2010; Bruffaerts et al., 2018). Indonesian university students face additional culture-specific pressures related to family expectations, collectivistic values, and rapid social change, which existing instruments fail to adequately capture (Kitayama & Uskul, 2011).

The validation research conducted in neighboring Southeast Asian countries further supports the necessity of developing region-specific instruments. Studies from Malaysia, Thailand, and the Philippines have successfully demonstrated improved diagnostic accuracy and clinical utility when using culturally adapted scales compared to direct translations of Western instruments (Abdul Kadir & Bifulco, 2010; Udomratn, 2008). These findings collectively emphasize that mental health assessment must be grounded in local cultural contexts to achieve meaningful and actionable results.

Addressing this critical gap, the present study develops and validates the Student Mental Health Scale (SMHS) as a reliable and contextually grounded instrument specifically designed for Indonesian university students. The SMHS is designed to serve as a psychometrically sound tool, validated using the Rasch Model, which enables rigorous item analysis and ensures measurement precision. This study does not attempt to perform causal or predictive analyses of risk factors, but rather focuses on establishing the scale's validity and offering a descriptive overview of students' mental health profiles.

The main objective of this study is to develop and validate the Student Mental Health Scale (SMHS) to assess the mental health levels of university students in Indonesia. With the availability of SMHS, higher education institutions are anticipated to conduct more accurate mental health assessments and facilitate timely interventions. Additionally, the study aims to offer guidance and training to educators and campus health professionals on implementing the scale, enabling them to support students' mental health more effectively and build a more nurturing academic environment.

Method

This study employed a quantitative approach with a cross-sectional research design. Participants were undergraduate students from nine faculties at Universitas Pendidikan Indonesia, Bandung, Indonesia. Simple random sampling was used to ensure each member of the population had an equal probability of selection. Data were collected through self-report questionnaires administered online. The final sample consisted of 266 students. Participant demographics are summarized in Table 1.

Table 1. Research Participants

No	Aspects	N
1	Gender	
	Male	52
	Female	214
2	Faculty	
	Faculty of Educational Sciences (FIP)	86
	Faculty of Language and Literature Education (FPBS)	66
	Faculty of Economics and Business Education (FPEB)	8
	Faculty of Social Science Education (FPIPS)	16
	Faculty of Educational Technic and Industry (FPTI)	27
	Faculty of Sport and Health Education (FPOK)	8
	Faculty of Mathematics and Science Education (FPMIPA)	36
	Faculty of Art and Design Education (FPSD)	11
	Faculty of Medicine (FK)	8

The Student Mental Health Scale (SMHS) was developed as a culturally-appropriate instrument to assess university students' mental health within the Indonesian context. The

development process followed a systematic approach beginning with construct identification through an integrative literature review of student mental health frameworks, supplemented by national health guidelines and expert consultation.

During the item generation phase, researchers created an initial pool of 63 items covering essential dimensions including emotional well-being, academic functioning, stress management, and social connectedness. These dimensions were selected to provide comprehensive coverage of university students' psychological experiences. Content validation involved three psychology and education experts who evaluated each item for relevance, clarity, and cultural appropriateness. Based on their feedback, eight items underwent revision while five were eliminated, resulting in a final 35-item instrument that met rigorous quality standards.

The instrument employs a four-point Likert scale format, with responses ranging from 1 ("Strongly Disagree") to 4 ("Strongly Agree"). This configuration enables participants to express their degree of agreement with mental health-related statements while providing sufficient response variability for robust statistical analysis. The resulting SMHS represents a methodologically sound tool specifically designed for Indonesian university students' mental health assessment.

The present study employed the Rasch Model as the primary analytical framework for instrument validation and response analysis. This methodological choice was grounded in the model's foundation within item response theory, which provides substantial advantages over traditional classical test theory approaches. The Rasch Model's capacity to generate interval-level measurements while simultaneously evaluating both item and person fit represents a significant methodological advancement (Bond & Fox, 2007). Particularly noteworthy is the model's ability to ensure that item difficulty parameters remain independent of respondent ability levels, thereby enhancing measurement objectivity.

The analytical protocol encompassed comprehensive assessments including item reliability indices, separation parameters, person reliability metrics, and detailed examination of item fit statistics through infit and outfit mean square values. Additionally, item-person mapping and unidimensionality verification through principal component analysis of residuals were conducted. The deliberate exclusion of classical test theory methodologies was justified by their inherent susceptibility to sample dependency, which fundamentally compromises both generalizability and interpretability of measurement precision in psychometric research.

Findings

The Rasch Model was applied to analyze the structure and functionality of the SMHS. The item and person reliability indices met acceptable psychometric standards, with item reliability at 0.99 and person reliability at 0.67 (Table 2. Summary Statistics), indicating consistency and discriminative power. The unidimensionality of the scale was supported by Principal Component Analysis (PCA) of residuals, in which the explained variance was above 40%, and the unexplained variance in the first contrast remained below 15% (Table 3. Unidimensionality).

Table 2. Summary Statistics

Aspect	Infit MNSQ	Infit ZSTD	Outfit MNSQ	Outfit ZSTD	*Reliability*	*Separation*	*Cronbach Alpha*
Person	1.02	-0.1	1.05	0.0	0.67	1.41	0.70
Item	1.04	0.1	1.05	0.2	0.99	12.9	

Table 3. Unidimensionality

Table of standardized residual variance (in eigenvalue units)		--	Empirical	--	Modeled
Total raw variance in observations	=	129.3	100.0%		100.0%
Raw variance explained by measures	=	71.3	55.1%		55.9%

Table of standardized residual variance (in eigenvalue units)		--	Empirical	--	Modeled
Raw variance explained by persons	=	3.4	2.6%		2.7%
Raw Variance explained by items	=	67.9	52.5%		53.3%
Raw unexplained variance (total)	=	58.0	44.9%	100.0%	44.1%
Unexplned variance in 1st contrast	=	7.6	5.9%	13.2%	
Unexplned variance in 2nd contrast	=	3.4	2.7%	5.9%	
Unexplned variance in 3rd contrast	=	2.8	2.2%	4.8%	
Unexplned variance in 4th contrast	=	2.4	1.9%	4.2%	
Unexplned variance in 5th contrast	=	2.3	1.8%	3.9%	

Based on the item fit testing criteria (Table 4. Item Fit), it was found that the Outfit MNSQ values for six items did not meet the fit criteria: items 16, 27, 38, 47, 60, and 63. According to the Outfit ZSTD values, 29 items met the fit criteria: items 3, 4, 5, 6, 10, 12, 15, 16, 18, 19, 24, 25, 26, 27, 28, 35, 38, 41, 45, 46, 47, 50, 52, 53, 58, 59, 60, 62, and 63. Based on the Point Measure Correlation values, 30 items were identified as fitting the criteria: items 2, 3, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 22, 25, 30, 38, 39, 40, 47, 51, 52, 55, 57, 59, 60, 61, and 63.

Table 4. Item Fit

Item Number	Outfit MNSQ	Outfit ZSTD	Pt. Measure Corr.
1	1.11	.8	-.17
2	1.41	2.0	.14
3	1.29	4.0	.34
4	1.46	2.6	.40
5	1.26	3.6	.20
6	1.36	5.0	.32
7	1.15	.9	.16
9	1.06	.5	.13
10	1.48	3.9	.16
11	.91	-1.0	.32
12	1.18	2.5	.09
14	1.05	.4	.01
15	1.40	4.9	.36
16	3.36	8.6	.07
17	1.07	.8	.40
18	1.44	2.9	.14
19	1.42	4.6	.28
20	.89	-1.5	.32
21	.85	-1.4	.40
22	.89	-1.8	.29
23	.92	-.7	.47
24	.75	-2.5	.41
25	.80	-3.1	.28
26	.75	-3.8	.54
27	.48	-8.7	.49
28	.73	-3.3	.48
30	.85	-1.0	.33
33	.85	-1.2	.44
34	.77	-1.6	.41
35	.78	-3.1	.56
36	1.01	.1	.45
37	.95	-.5	.40
38	2.72	8.4	.14
39	1.17	1.2	.27
40	.86	-1.2	.26
41	.75	-2.3	.42

Item Number	Outfit MNSQ	Outfit ZSTD	Pt. Measure Corr.
45	.74	-4.4	.42
46	.72	-4.0	.55
47	2.00	4.0	.20
48	.99	-.1	.49
50	.84	-2.2	.54
51	.85	-1.6	.36
52	1.37	2.1	.30
53	.72	-4.4	.51
55	.83	-.8	.18
56	1.07	.9	.43
57	1.04	.3	.31
58	.69	-3.0	.57
59	1.45	4.2	.39
60	1.98	6.0	.25
61	.81	-.9	.39
62	.52	-5.5	.42
63	1.65	7.2	.00
MEAN	1.10	.2	
S.D.	.47	3.2	

According to the criterion that an item can be considered fit if it meets at least one of the three fit and/or validity criteria, it was concluded that five items—16, 38, 47, 60, and 63—were misfit for measuring mental health, as they fell into the misfit category across all testing criteria. Therefore, these five items were removed from further data processing, as another item was sufficient to represent the same indicator. Consequently, a total of 58 items were deemed fit and/or valid to measure the mental health scale.

These results affirm that SMHS is a valid and reliable tool for measuring mental health status among Indonesian university students. The person-item map also indicated a relatively normal distribution, providing strong evidence for the scale's ability to distinguish among varying levels of student mental health. The distribution of mental health levels among students reveals significant patterns that warrant careful examination and targeted intervention strategies. Table 5. presents a comprehensive breakdown of student mental health categorization based on logit ranges, providing crucial insights into the psychological well-being of the student population.

Table 5. Distribution of Mental Health Levels Among Students

Category	Logit Range	N	%	Key Description
Healthy	≥ -0.12	49	19.8%	Optimal mental health; high emotional resilience; effective stress management.
Moderately Healthy	-0.46 to -0.12	147	59.5%	Reasonable mental health; potentially vulnerable to stress; requires preventive care.
Less Healthy	≤ -0.46	51	20.6%	High psychological distress; possible symptoms of anxiety, depression, or burnout.

The data presented in Table 5 demonstrates a tripartite distribution of mental health status, with distinct characteristics and intervention requirements for each category.

Healthy Students (19.8%)

Students classified within the healthy category demonstrate optimal psychological functioning characterized by high mental resilience and effective emotional regulation capabilities. These individuals typically possess robust coping mechanisms that enable them to navigate academic and personal challenges successfully (Immanuel et al., 2021). Research indicates that such students not only maintain their own psychological well-being but also possess the capacity to contribute positively to their peer networks through mentoring and support activities (Seligman, 2011; Lee & Kim, 2023; Tennant et al., 2007). Their emotional stability and adaptive

functioning position them as potential resources within institutional mental health promotion strategies.

Moderately Healthy Students (59.5%)

The majority of the student population falls within the moderately healthy category, representing individuals who maintain relative psychological stability while remaining susceptible to stress-related deterioration. This demographic exhibits baseline mental health functioning but demonstrates vulnerability when confronted with chronic stressors or inadequate support systems. Empirical evidence suggests that students in this category demonstrate the highest responsiveness to preventive interventions, including resilience training programs, mental health literacy initiatives, and structured peer support mechanisms (Johnson et al., 2024; Keyes, 2005). The substantial proportion of students within this category underscores the critical importance of implementing proactive mental health promotion strategies.

Less Healthy Students (20.6%)

Students categorized as less healthy present concerning levels of psychological distress that significantly impact both academic performance and social functioning. This population typically exhibits symptoms consistent with anxiety disorders, depressive episodes, or burnout syndrome, necessitating immediate and comprehensive intervention approaches. Evidence-based treatments for this demographic include individual counseling services, therapeutic group interventions, and crisis response protocols (Kaligis et al., 2021; Tran et al., 2023). The substantial representation of students within this category signals an urgent need for enhanced mental health.

The findings align with national and international reports that university students are increasingly at risk of mental health issues. For example, Ibrahim et al. (2013) found global student depression rates ranging from 10% to 85%, while recent Indonesian studies report anxiety affecting up to 95.4% of youth (Kaligis et al., 2021). Women in particular were shown to experience higher stress and emotional distress, consistent with previous findings by Son et al. (2020) and Faradiba et al. (2023). This reinforces the importance of gender-sensitive interventions.

Contextual studies in Indonesia (Putra & Mudjiran, 2023; Kloping et al., 2022) further confirm the prevalence of academic stress, emotional isolation, and burnout as dominant risk factors in university settings. These align with the observed data where the "Moderately Healthy" group, though functioning, remains vulnerable to regression without adequate support.

Discussion

These findings align with global trends, where university students experience high levels of stress, anxiety, and emotional fatigue due to academic and social pressures. For example, Ibrahim et al. (2013) noted that the prevalence of depression among university students ranges widely from 10% to 85%, averaging around 30.6%. The 20.6% of students in the "Less Healthy" group in this study corresponds to this global average, reinforcing that Indonesian students are similarly vulnerable.

Students in the "Moderately Healthy" group, although not acutely distressed, are not immune. This group often copes with daily challenges but may lack robust stress-buffering strategies. Without sufficient support—such as resilience training or access to mental health services—this group risks transitioning into poorer mental health states (Keyes, 2005; Lazarus & Folkman, 1984). Compared to Brougham et al. (2009), who emphasize the protective role of problem-focused coping in maintaining psychological equilibrium, our findings suggest that such coping skills may be underdeveloped in many students.

Female students showed greater representation in the "Less Healthy" category, echoing earlier studies that report gender-based vulnerability in mental health outcomes. For example, Son et al. (2020) and Alsulami et al. (2018) found that women tend to report higher stress levels and internalize

emotional distress more frequently than men. Indonesian studies also support this trend—Faradiba et al. (2023) noted higher levels of self-harm and anxiety among female students, highlighting the need for gender-sensitive approaches in intervention design.

Local data also supports these findings. Kaligis et al. (2021) reported that 95.4% of Indonesian students aged 16–24 experienced anxiety, while nearly half disclosed suicidal ideation or self-harm. Other studies identify academic anxiety, relational stress, and a sense of hopelessness about the future as common sources of psychological strain (Putra & Mudjiran, 2023; Kloping et al., 2022). This confirms that the SMHS captures real and context-specific distress patterns within Indonesian campuses.

Interestingly, our findings also identify a core group of students (19.8%) categorized as "Healthy," characterized by high resilience and emotional regulation. These students demonstrate adaptive coping strategies, effective time management, and strong interpersonal relationships. They resemble Seligman's (2011) concept of flourishing individuals who remain productive and emotionally balanced under pressure. Gross (2014) and Shankland & Rosset (2017) similarly argue that emotional regulation skills are key to academic and social success. Moreover, Swickert et al. (2019) highlight that strong peer support networks enhance well-being—suggesting that students in this category may serve as effective peer mentors.

These results emphasize the need for multilayered interventions. For students in the "Less Healthy" category, psychological counseling and therapy should be made accessible. For those "Moderately Healthy," proactive strategies such as life-skills training, mental health literacy programs, and peer support groups are crucial. Research has shown that resilience-based interventions—mindfulness, psychoeducation, and emotional regulation—can significantly improve stress response (Albufaraj et al., 2024; Worsley et al., 2022).

Beyond individual strategies, systemic solutions are required. Despite the growing need, most universities in Indonesia lack formal policies to address psychological distress (Putri et al., 2023). This institutional gap contrasts with global best practices, where mental health policies ensure transparency, consistency, and inclusive care (Hartrey et al., 2017; Morgan et al., 2018). Establishing campus-wide mental health protocols, staff training, and embedded wellness programs is no longer optional—it is essential for fostering a safe and supportive academic environment.

Formal policies also enable universities to respond swiftly to early signs of distress, facilitate access to services (e.g., counseling, peer mentoring), and promote a culture that normalizes mental health conversations (Kutsyuruba et al., 2015; Hite, 2019). Without such systems, even a reliable instrument like SMHS cannot fully realize its potential as a preventive tool. Recent policy evaluations recommend integrating evidence-based frameworks within institutional mental health strategies to ensure sustainability and inclusivity (OECD, 2023).

Conclusion

This study successfully contributes to the development of a culturally contextualized and psychometrically validated instrument, the Student Mental Health Scale (SMHS), for assessing university students' mental health in Indonesia. Using the Rasch Model, the scale demonstrated strong reliability, item fit, and unidimensionality, confirming its suitability as a reliable and valid instrument for practical application in higher education settings. While the person separation value indicates some limitations in differentiating between respondents with varying mental health statuses, the high item separation value demonstrates the instrument's ability to capture a wide range of mental health difficulties. Findings revealed that although most students fall within a "Moderately Healthy" range, a significant portion shows signs of psychological vulnerability, underscoring the urgent need for universities to adopt reliable screening tools for early identification and intervention. The importance of addressing mental health in university settings cannot be overstated, especially given the increasing global prevalence of mental health issues among students. This validated instrument enables institutions to provide better support and interventions while fostering supportive, responsive, and preventive academic environments.

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