

Differential Item Functioning of an Academic Stress Scale Among Generation Z Students in Indonesian Islamic Higher Education: A Rasch Rating Scale Model Analysis

 Dina Hajja Ristianti^{1*},  Afriyadi Sofyan²,  Idi Warsah¹

¹ Institut Agama Islam Negeri Curup, Indonesia

² Universitas Negeri Semarang, Indonesia

 dinahajja@iaicurup.ac.id*

Article Information:

Received 2026-02-02

Revised 2026-04-16

Published 2026-04-20

Keywords:

Rasch Rating Scale Model; academic stress; differential item functioning; Islamic higher education; measurement fairness

Abstract

This study evaluated the psychometric properties and measurement fairness of a 25-item academic stress scale among Generation Z undergraduate students at three Indonesian Islamic higher education institutions. Using a cross-sectional design with a final analytical sample of 401 participants (after person-fit screening from an initial $N = 517$), data were analyzed using the Rasch Rating Scale Model (RSM) to assess rating scale category functioning, item fit, person-item targeting, reliability, and Differential Item Functioning (DIF) across sex, age group, semester, and current living arrangement. Andrich thresholds advanced monotonically ($-1.07, -0.79, 0.61, 1.25$ logits), confirming that all five response categories represent psychometrically distinct levels of academic stress. Of 25 items, 21 demonstrated acceptable fit; the four misfitting items were concentrated in the Social and Academic Support dimension, consistent with the context-sensitivity of support perceptions in Islamic educational settings. Scale reliability was adequate for group-level research (person reliability = .85; item reliability = .98; Cronbach's $\alpha = .88$; person separation = 2.41), and person-item targeting was satisfactory (person mean = 0.33 logits). DIF analysis identified seven items with significant sex-based non-equivalence, 17 and 16 items with substantive DIF measure ranges across age group and semester, respectively, and two items with residence-based DIF, collectively indicating that academic stress items function differently across demographic subgroups, particularly for institutional help-seeking, family support, anxiety expression, and time management. These findings demonstrate that while the scale possesses adequate psychometric quality for population screening, measurement invariance is partially violated, and raw-score comparisons across subgroups should be interpreted with caution. Academic stress assessment in Indonesian Islamic higher education should integrate demographic and developmental context, including academic stage and spiritual coping resources, to ensure fair and clinically meaningful score interpretation.

INTRODUCTION

Academic stress is among the most prevalent psychological concerns affecting undergraduate students worldwide, with particularly high rates reported in Indonesian higher education contexts, including among students at Islamic institutions, where prevalence has been documented as exceeding 50% (Zamroni et al., 2019). This figure is not merely a statistical footnote; it reflects a systemic condition with far-reaching consequences for students' academic achievement, mental well-being, and the quality of their Islamic formation as learners. Studies across Islamic higher education contexts consistently document elevated rates of stress, anxiety, and burnout stemming from assignment overload, performance demands, and the challenge of balancing academic obligations with religious and social commitments (Triyuliasari et al.,

How to cite:

Ristianti, D. H., Sofyan, A., & Warsah, I. (2026). Differential Item Functioning of an Academic Stress Scale Among Generation Z Students in Indonesian Islamic Higher Education: A Rasch Rating Scale Model Analysis. *Islamic Guidance and Counseling Journal*, 9(2). <https://doi.org/10.25217/0020269781700>

E-ISSN:

2614-1566

Published by:

Institut Agama Islam Ma'arif NU (IAIMNU) Metro Lampung

2025; Zamroni et al., 2018). Within Indonesian Islamic higher education institutions (perguruan tinggi keagamaan Islam/PTKI), both internal factors, including low self-efficacy and poor time management, and external factors such as social pressure and family expectations have been shown to contribute significantly to students' academic stress, with downstream consequences including impaired concentration, diminished learning motivation, reduced problem-solving capacity, and heightened risk of psychological disorders such as anxiety and depression (Basri et al., 2025; Iskandar et al., 2024; Zamroni et al., 2019).

At the same time, the growing literature in Islamic psychology and Islamic educational psychology offers an alternative lens: that religious values and spiritual practices, including *sabar* (patience), *tawakal* (reliance on God), *syukur* (gratitude), *ikhlas* (sincerity), *prayer*, *dhikr* (remembrance of God), and an internalized understanding of *takdir* dan *qadar* (divine decree), may function as spiritual resources that strengthen academic resilience and psychological hardiness (Aprilianti, 2024; Nasrin, 2025; Qudsyi & Fadlillah, 2025). Research suggests that integrating Islamic values into coping strategies and learning practices helps students reframe academic pressure as a process of personal maturation, reduces perceived stress, anxiety, and academic burnout, and enhances overall psychological well-being (Dzikra et al., 2025; Elfattah, 2025; Wahyuni et al., 2024). This perspective implies that the urgency of academic stress in Islamic higher education is not only a matter of prevalence and negative consequences, but also an opportunity, both theoretically and practically, to develop stress management and resilience-building models grounded in Islamic values (such as *tawakal*, *sabar*, *syukur*, *ikhlas*, and *dhikr*) thereby responding to longstanding critiques of mainstream psychology's relative neglect of the spiritual and transcendent dimension of human experience (Dubey et al., 2024; Schwarz, 2018; Sumaiya et al., 2025).

Despite this, the psychometric quality of academic stress measurement instruments in this context remains understudied. Valid and fair measurement is a precondition for accurate assessment, meaningful group comparisons, and evidence-based counseling interventions (Moore & Dorn, 2026); yet most instruments used in Indonesian Islamic higher education have been validated using classical test theory approaches that cannot evaluate item-level measurement bias across demographic subgroups.

The Rasch Rating Scale Model (RSM) offers a principled framework for addressing these limitations. Unlike classical test theory, Rasch measurement evaluates each item against a mathematically specified model of how persons and items should interact, enabling the detection of misfitting items, the verification of rating scale category functioning, and crucially the assessment of Differential Item Functioning (DIF), which examines whether items function equivalently across groups such as sex, age, and academic stage (Bond et al., 2021; Moore & Dorn, 2026). DIF analysis is particularly relevant in counseling contexts because academic stress, as a construct shaped by cognitive appraisal and sociocultural context (Lazarus & Folkman, 1985), may be expressed and interpreted differently across demographic subgroups, differences that can lead to biased scores and inequitable counseling decisions if undetected (Elfattah, 2025). This concern is especially salient in Islamic higher education settings, where the meaning students assign to academic difficulty is simultaneously shaped by developmental factors, socioeconomic context, and religious worldview, all of which may vary systematically across student subgroups in ways that conventional psychometric methods cannot detect.

However, no prior studies have systematically evaluated item-level measurement invariance of academic stress instruments within Indonesian Islamic higher education using Rasch-based DIF analysis. The present study addresses this gap by applying the Rasch RSM to a 25-item academic stress scale administered to undergraduate students at three Islamic higher education institutions in Indonesia. The study focuses specifically on Generation Z students, defined as individuals born between 1997 and 2012 (Seemiller & Grace, 2016), because this cohort currently constitutes the dominant undergraduate population in Indonesian higher

education. Students who enrolled between 2021 and 2025, the period encompassing the present sample, fall squarely within this generational range. This demographic focus is not merely descriptive; Generation Z students present a distinct academic stress profile shaped by their developmental characteristics, including heightened digital dependency, increased exposure to academic comparison through social media, greater awareness of global career uncertainty, and a pattern of blurred boundaries between academic and personal life that prior generations did not experience to the same degree (Csobanka, 2016; Twenge, 2017). These characteristics may influence not only the level of academic stress experienced, but also how stress is expressed and perceived. Therefore, how items on a stress scale are interpreted and endorsed across subgroups can introduce measurement bias. Validating a measurement instrument specifically within this population is thus theoretically warranted, not merely a convenience of sampling timing.

Specifically, the study aimed to: (1) evaluate rating scale category functioning, item fit, and scale reliability; (2) examine person-item targeting; and (3) investigate DIF across sex, age group, semester, and current living arrangement. Findings are intended to provide psychometric evidence to support or refine the use of this scale in Indonesian Islamic higher education counseling practice, and to contribute to the growing literature on fair measurement of psychological constructs in non-Western counseling contexts.

METHODS

Design

This cross-sectional study evaluated the psychometric properties of an academic stress scale using the Rasch RSM, with particular attention to DIF across four demographic variables: sex (male vs. female), age group (17–18, 19–20, 21–22, ≥ 23 years), semester (2nd, 4th, 6th, 8th and above), and current living arrangement (family, rented accommodation, dormitory). DIF was selected over mean-score group comparisons (e.g., t-test, ANOVA) because it disentangles item-level measurement bias from true group differences in the latent trait (Moore & Dorn, 2026; Tennant & Küçükdeveci, 2023). For sex and living arrangement, groups permitting valid pairwise comparison, DIF was evaluated via Winsteps split-group estimation, which separately calibrates item difficulty per group and tests the difference (DIF contrast) using the Rasch-Welch t-test (Linacre, 2022; Moore & Dorn, 2026). Statistical significance was set at $p < .05$, with substantive DIF defined as a contrast $\geq .10$ logits (Rouquette et al., 2019); contrasts were further classified as negligible ($< .43$), moderate (.43–.64), or large ($> .64$ logits) following Zwick et al. (1999). For age group and semester, where single-person Winsteps reference groups precluded valid Rasch-Welch t-tests, the DIF measure range across subgroups ($\geq .30$ logits) was used as the effect size criterion. DIF findings were subsequently evaluated for whether they reflect construct-irrelevant bias or construct-relevant impact — true variation in how academic stress is experienced across groups (Millsap, 2012; Moore & Dorn, 2026).

Participants

A total of 517 undergraduate students were initially recruited from three Islamic higher education institutions in Indonesia: Institut Agama Islam Negeri (IAIN) Curup, Universitas Islam Negeri (UIN) Fatmawati Sukarno Bengkulu, and Universitas Islam Nusantara (UIN) Al-Azhaar Lubuk Linggau. IAIN Curup and UIN Fatmawati Sukarno Bengkulu are public Islamic universities, while UIN Al-Azhaar Lubuk Linggau is a private Islamic institution. All three are located in Sumatra, Indonesia.

Prior to the main analysis, data screening was conducted in accordance with the requirements of the Rasch Rating Scale Model. Person-fit statistics were examined for each respondent, and individuals whose response patterns showed substantial misfit to the model, as indicated by infit mean square (MNSQ) values outside the acceptable range of 0.6 to 1.4 (Bond

et al., 2021), were excluded from further analysis. Following this screening process, 116 cases were removed, yielding a final analytical sample of 401 participants. Detailed demographic characteristics of the final analytical sample are presented in Table 1.

Table 1. Demographic Characteristics of Participants ($N = 401$)

Characteristic	<i>n</i>	%
<i>Institution</i>		
IAIN Curup	237	59.1
UIN Fatmawati Sukarno Bengkulu	144	35.9
UIN Al-Azhaar Lubuklinggau	20	5.0
<i>Faculty</i>		
Tarbiyah/Teacher Education	317	79.1
Ushuluddin, Adab, and Da'wah	56	14.0
Sharia and Islamic Economics	28	7.0
<i>Sex</i>		
Female	305	76.1
Male	96	23.9
<i>Age (years)</i>		
17–18	30	7.5
19–20	202	50.4
21–22	148	36.9
≥23	21	5.2
<i>Semester</i>		
2nd	89	22.2
4th	140	34.9
6th	133	33.2
8th	37	9.2
10th or above	2	0.5
<i>Current residence</i>		
Living with family	186	46.4
Rented room or other	167	41.6
Dormitory / boarding house	48	12.0

Instruments

Academic stress was measured using a 25-item scale (see Appendix A) developed for the present study and adapted from the Student-Life Stress Inventory (SLSI) (Gadzella, 1994), a well-established instrument designed to assess stressors and stress reactions among college students. The original SLSI has demonstrated adequate psychometric properties in prior research, including construct validity evidence showing that 44 of its 51 items reflect a unidimensional structure (Putra, 2015), supporting its suitability as a developmental foundation for the current instrument.

Given that the original SLSI was not specifically designed for Generation Z students within Indonesian Islamic higher education contexts, the instrument was systematically adapted to reflect the academic demands, social dynamics, and cultural expectations characteristic of this population. The adaptation involved a content review by two subject-matter experts in counseling and psychology, followed by cognitive interviews with ten representative students to identify ambiguous or unclear items.

Content validity was established through expert review, and construct validity was evaluated using Rasch analysis. The final 25-item scale encompasses five dimensions of academic stress: (1) academic workload, reflecting perceived burden from assignments and academic responsibilities; (2) academic pressure, capturing performance expectations from self, parents, and institutional standards; (3) social and academic support, assessing the availability of peer, faculty, and institutional support resources; (4) mental and physical health, tapping stress-related physical symptoms and emotional well-being; and (5) time management and study skills, measuring difficulties in organizing academic tasks and maintaining study effectiveness. Each item is rated on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher total scores indicating greater academic stress.

Procedure

Data was collected between April and May 2025 using a self-administered online questionnaire distributed via Google Forms. The survey link was disseminated through multiple channels, including direct messaging via WhatsApp, sharing through student group platforms, and distribution facilitated by lecturers and academic staff at each of the three participating institutions. Participation was voluntary, and no incentives were provided. Before accessing the questionnaire items, all prospective participants were presented with an information screen outlining the study purpose, the voluntary and anonymous nature of participation, and their right to withdraw at any time without consequences. Completion of the questionnaire was taken as an indication of informed consent. Participants completed the instrument independently, without supervision or a time limit. To minimize response bias, participants were instructed to respond honestly and anonymously without time pressure.

Data Analysis and Measurement Model

The Rasch Rating Scale Model (RSM) (Andrich, 1978) was used to evaluate the psychometric properties of the academic stress scale. The RSM transforms ordinal scores into interval-level measures (logits), accounting for unequal category distances and enabling invariant measurement of latent constructs (Bond et al., 2021).

All 25 items were analyzed using a common rating-scale structure in Winsteps Version 5.7.2; (Linacre, 2022). Model fit was assessed using infit and outfit MNSQ (0.6–1.4) and ZSTD (–2.0 to +2.0). Unidimensionality was examined through principal component analysis of residuals (PCAR), and local independence was evaluated using residual correlations. Targeting was assessed via the Wright map. Reliability was evaluated using the person separation index (≥ 2.0), person reliability ($\geq .80$), and Cronbach's alpha. Results are summarized in Table 2.

Table 2. Summary Statistics of Person and Item Measures from Rasch Analysis

Statistic	Person	Item
<i>N</i>	401	25
Measure (logits)		
Mean	0.33	0.00
<i>SD</i>	0.67	0.45
Range	–1.67 to 3.88	–0.94 to 1.19
Model fit		
Infit MNSQ, mean (<i>SD</i>)	1.02 (0.70)	1.00 (0.27)
Infit ZSTD, mean (<i>SD</i>)	–0.37 (2.39)	–0.31 (3.98)
Outfit MNSQ, mean (<i>SD</i>)	1.04 (0.74)	1.04 (0.34)
Outfit ZSTD, mean (<i>SD</i>)	–0.34 (2.36)	0.07 (4.54)
Reliability		
Separation index	2.41	7.79
Reliability	.85	.98
Cronbach's alpha	.88	—

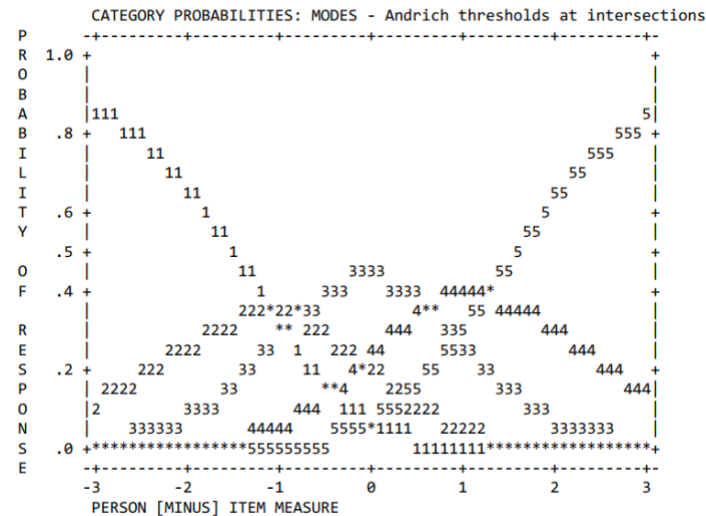
Note. Analyses were conducted using Winsteps (Version 5.7.2; Linacre, 2022) with the Andrich (1978) Rating Scale Model (RSM). Under the RSM, all items share a common set of rating scale category thresholds. Logit = log-odds unit; MNSQ = mean square fit statistic; ZSTD = standardized fit statistic; separation index and reliability are based on real root mean square error (RMSE). Acceptable infit and outfit MNSQ range: 0.6–1.4 for rating scale data (Bond et al., 2021). Person mean measure (0.33) approximates item mean (0.00), indicating adequate targeting of the instrument to the sample.

RESULTS

Rating Scale Category Functioning

Andrich thresholds advanced monotonically (–1.07, –0.79, 0.61, 1.25 logits), confirming that all five response categories represent psychometrically distinct levels of academic stress. The category probability curves demonstrated that each response category functioned as intended. Lower categories were most probable at lower levels of academic stress, whereas higher categories were more common at higher logit values. The orderly progression of

category peaks and intersections indicates well-ordered thresholds and appropriate functioning of the five-point rating scale.



Note. Each curve represents the probability of endorsing a response category across the latent trait continuum (logits). The orderly progression of peaks indicates properly functioning rating scale categories.

Figure 1. Category Probability Curves for the Five-Point Academic Stress Scale

Item Fit and Hierarchy.

Of 25 items, 21 showed acceptable Rasch fit (MNSQ 0.6–1.4). Four items underfitted: I15 (infit = 1.58, outfit = 1.95), I11 (infit = 1.47, outfit = 1.61), I7 (infit = 1.34, outfit = 1.55), and I13 (infit = 1.27, outfit = 1.42), all in the Social and Academic Support dimension, consistent with the context-sensitivity of social support perceptions. Item difficulties ranged from -0.94 (I25) to 1.19 logits (I8), with Academic Pressure items hardest and Time Management items easiest to endorse (see Appendix B).

Person-Item Targeting and Reliability.

The person mean (0.33 logits) closely matched the item mean (0.00), indicating adequate targeting. Person separation reliability was 0.85 ; item reliability was 0.98 ; Cronbach's alpha was 0.88 . The scale can distinguish approximately three levels of academic stress (separation index = 2.41).

Differential Item Functioning.

Complete DIF results are presented in Appendix C. For sex, seven items showed significant and substantive DIF ($p < .05$, $ES \geq .10$): I3, I9, and I17 favored female students ($ES = .30$ – $.33$), while I13, I14, I23, and I24 favored male students ($ES = .31$ – $.36$). For living arrangement, I15 favored dormitory over family residents ($ES = .49$, $t = 2.40$, $p = .019$) and I23 favored dormitory over rented residents ($ES = .36$, $t = 2.10$, $p = .039$). For age group and semester, where pairwise Rasch-Welch t-tests were unavailable, DIF measures ≥ 0.30 logits were observed for 17 and 16 items, respectively. For age group, Social and Academic Support items showed the largest ranges, I15 (range = $.90$), I13 ($.82$), I12 ($.81$), and I14 ($.70$), all exceeding the large-DIF threshold of $.64$ logits (Zwick et al., 1999), with students aged 21–22 consistently showing higher DIF measures than those aged ≥ 23 for institutional support items, while the youngest group (17–18) showed higher DIF measures for procrastination (I23) and time management (I25, range = $.71$). For semester, sleep difficulties (I18; range = $.63$), parental expectations (I7; range = $.61$), and study-life balance (I4; range = $.55$) showed the widest variation, with senior students (8th semester and above) showing higher DIF measures for

anxiety and sleep items and junior students (2nd semester) showing higher DIF measures for procrastination and workload items.

Person-Item Targeting and Scale Reliability

The Wright map (Figure 2) displays the joint distribution of person measures and item difficulties along the shared logit continuum. The mean person measure (0.33 logits) closely approximated the mean item difficulty (0.00 logits), indicating adequate targeting between the instrument and the sample. The distribution of person measures ranged from -1.67 to 3.88 logits, with most students clustering between -0.5 and 1.5 logits, corresponding to moderate to high academic stress. A person separation index of 2.41 and a person reliability of .85 indicate that the scale distinguished approximately three statistically distinct strata of academic stress levels among the participants. Item reliability was .98 with a separation index of 7.79, confirming that the 25 items were well-differentiated along the stress continuum and that the item difficulty hierarchy would replicate with other comparable samples.

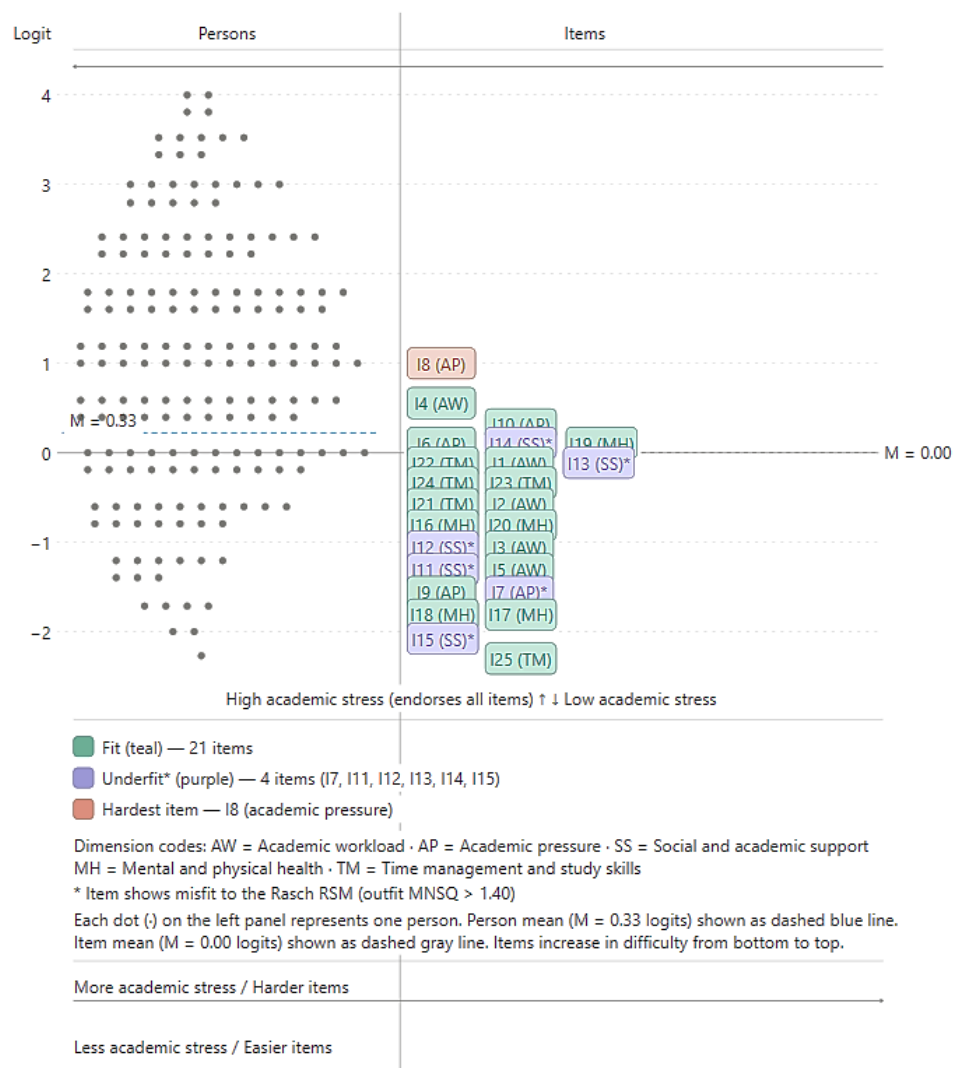


Figure 2. Person–Item Map (Wright Map)

DISCUSSION

This study examined the psychometric properties and measurement fairness of a 25-item academic stress scale administered to Generation Z undergraduate students at three Indonesian Islamic higher education institutions, using the Rasch Rating Scale Model. The findings address

three interrelated questions: whether the scale functions adequately as a measurement instrument, whether its item difficulty hierarchy is theoretically interpretable, and whether items function equivalently across key demographic subgroups. Each of these questions carries distinct implications for counseling research and practice in the PTKI context.

Psychometric Adequacy and Rating Scale Functioning

The ordered Andrich thresholds confirm that all five response categories function as psychometrically distinct, a finding that carries interpretive weight beyond mere technical adequacy. Disordered thresholds are a persistent problem in Likert-type scales applied to Asian student populations, typically signaling that respondents conflate adjacent categories, quietly invalidating total scores regardless of how well the items are written. Their absence here suggests that students in Indonesian Islamic higher education can meaningfully navigate the full response continuum, lending empirical support to the cross-cultural viability of five-point formats in contexts where this has remained contested (Bond et al., 2021).

The reliability profile tells a similarly coherent story about what this instrument can and cannot do. A person separation index of 2.41, which distinguishes approximately three stress strata, is not a limitation but a calibration: it marks the scale as appropriately suited for group-level screening and institutional comparisons rather than for individual clinical inference. The near-perfect item reliability (.98) further suggests that the item difficulty hierarchy would replicate across comparable samples, making the instrument a viable normative benchmark across institutions or time points. Together, these indicators position the scale within the range established by prior Rasch-based psychological measurement in Indonesian higher education (Zamroni et al., 2019) and meet the standards recommended for counseling measurement contexts (Moore & Dorn, 2026).

Item Hierarchy and Theoretical Interpretation

The item difficulty hierarchy, ranging from I25 (need to improve time management skills) to I8 (unhealthy competition with peers for grades), is substantively interpretable and theoretically coherent. Items in the Academic Pressure dimension cluster at the higher end of the difficulty continuum, indicating that experiences of peer competition (I8), disruption of life balance (I4), and institutional standard pressure (I10) represent more extreme manifestations of academic stress, endorsed only by students at the upper end of the latent trait. This pattern is consistent with Lazarus and Folkman (1985) transactional model of stress, in which higher-order appraisals involving social comparison and self-concept threat represent more cognitively demanding and individually variable sources of stress than more universal physiological or time-related experiences.

Conversely, items at the lower end, primarily from the Time Management and Mental and Physical Health dimensions, represent near-universal experiences among students in this sample. The finding that time management difficulty (I25), fatigue (I5), sleep disruption (), and physical health impacts (I17) are the most broadly endorsed items is consistent with Zamroni et al. (2019) finding that workload and time limitations are the most prevalent and universally shared sources of academic stress among first-year students in Indonesian Islamic higher education. It also aligns with the broader literature documenting that Generation Z students experience particularly acute boundary dissolution between academic and personal time, a characteristic of digital-native learners who carry academic tasks into all hours through connected devices (Csobanka, 2016; Twenge, 2017). From a counseling perspective, this hierarchy suggests that time management and fatigue-related interventions should be positioned as foundational, universally relevant services, while peer competition and social comparison pressures may require more targeted, individually tailored approaches (Aryani & Rahman, 2025; Triyuliasari et al., 2025).

Item Misfit: The Social and Academic Support Dimension

All four misfitting items, I15 (family support), I11 (peer support), I13 (counselor help-seeking), and I7 (parental expectations), are concentrated in the Social and Academic Support and Academic Pressure dimensions. This pattern is theoretically interpretable rather than a random psychometric artifact. Social support perceptions, by their very nature, reflect secondary appraisal processes that are far more sensitive to context, relationship history, and individual coping orientation than primary stress appraisals such as workload or fatigue (Lazarus & Folkman, 1985). The item misfit indices indicate that students at similar overall stress levels nonetheless respond to these items in highly variable and unpredictable ways, a measurement signature of construct-relevant heterogeneity rather than poor item wording. This interpretation is supported by the broader literature: research in Indonesian Islamic higher education consistently shows that perceived social support, from family, peers, and institutional sources, is a moderated rather than direct resource, with its effectiveness depending on religious coping orientation, gender role expectations, and the relational structure of the campus environment (Basri et al., 2025; Iskandar et al., 2024; Oktarosada et al., 2025). Students who have internalized Islamic values of *tawakal* (reliance on God) and *sabar* (patient endurance) may experience the same objective level of social support quite differently from students whose coping is primarily secular or peer-oriented, producing the high within-group response variance that drives misfit (Dzikra et al., 2025; Nasrin, 2025; Qudsyi & Fadlillah, 2025).

This interpretation does not excuse the misfit but does contextualize it. Rather than recommending immediate item deletion, the finding argues for a principled review of the Social and Academic Support subdimension. Future instrument development should consider whether perceived support is better treated as a moderating contextual variable rather than a direct component of the academic stress construct, particularly in Islamic higher education settings where spiritual resources may substitute for or complement formal social support networks (Akip et al., 2025; Aprilianti, 2024; Wahyuni et al., 2024).

Sex-Based DIF: Genuine Differences or Measurement Bias?

Seven items showed significant sex-based DIF. A central interpretive distinction in DIF analysis is whether observed item-level non-equivalence reflects construct-irrelevant bias, where an item systematically disadvantages one group due to factors unrelated to the target construct, or construct-relevant impact, where the DIF reflects genuine group differences in how academic stress is experienced and expressed (Elfattah, 2025; Millsap, 2012; Moore & Dorn, 2026).

Female-favored DIF for I3 (anxiety about meeting academic demands), I9 (career worry if grades are poor), and I17 (physical health impacts of academic stress) is most consistent with DIF impact. A substantial body of research documents that female students in Indonesian higher education experience and express anxiety, somatic symptoms, and career-related stress more overtly than male students, not because they are more stressed on average, but because they are more likely to verbalize and acknowledge these experiences (Irfan et al., 2024; Iskandar et al., 2024). This parallels gender-based DIF documented for depression scales in Muslim-majority contexts, where somatic and affective items systematically function differently across sexes even when controlling for latent trait level (Elfattah, 2025). From an Islamic psychology perspective, this pattern may also reflect differential socialization: female students in PTKI environments are often encouraged to express emotional vulnerability in ways consistent with Islamic femininity (*fitrah*), while male students may inhibit such expression (Basri et al., 2025).

Male-favored DIF for I13 (comfortable seeking campus counselor help) and I14 (campus resources adequate for stress management) raises a more concerning interpretive possibility. Male students in this sample endorsed these institutional support items more strongly than their overall stress level would predict, which, counterintuitively, may indicate that male students

are systematically overestimating institutional support adequacy relative to their actual stress experience, introducing a component of construct-irrelevant bias. This pattern could reflect Islamic masculine role expectations that discourage acknowledgment of stress while encouraging expressed confidence in institutional structures, or it could reflect actual structural differences in how male and female students access campus counseling services. Either interpretation has direct counseling implications: if female students are systematically underendorsing institutional help-seeking items relative to their stress level, they are less likely to appear as needing support on standardized screenings, creating a measurement-driven blind spot for counselors who rely on total scale scores without attending to item-level patterns (Moore & Dorn, 2026).

Male-favored DIF for I23 (procrastination) and I24 (concentration difficulty) may reflect genuine gender differences in how time management failures and attentional dysregulation are experienced and reported, though the relatively small effect sizes (.31–.33 logits) place these in the negligible-to-moderate range and warrant cautious interpretation. Research on procrastination in Indonesian male students has documented higher rates of behavioral procrastination, acting out delay through alternative activities, compared to female students who more frequently report affective procrastination characterized by anxiety and self-recrimination (Al et al., 2025).

Age-Based DIF: Developmental Transitions in Stress Appraisal

The large DIF measure ranges observed for Social and Academic Support items across age groups, I15 (range = .90), I13 (.82), I12 (.81), I14 (.70), all exceeding Zwick et al. (1999) large-DIF threshold of .64 logits, represent one of the most substantively significant findings of this study. These ranges indicate that the meaning and endorsability of institutional and family support items shift dramatically across developmental stages, not merely in their average levels but in their psychometric functions relative to the latent stress construct.

The pattern in which students aged 21–22 consistently show higher DIF measures than those aged ≥ 23 for institutional support items (I12, I13, I14) suggests that mid-undergraduate students are more actively engaged with and oriented toward campus resources, a developmental moment in which students have gained sufficient familiarity with the campus environment to recognize available services without yet developing the skepticism or self-sufficiency of more senior students. This interpretation is consistent with Maddi (2013) hardiness theory, in which repeated exposure to institutional challenge across university years builds psychological resources that alter how students appraise the adequacy of support structures. Older students who have accumulated more ambivalent or disappointing experiences with institutional counseling services may lower their expectations and thus endorse adequacy items less strongly than their overall stress level would predict, a form of adjusted expectation that masquerades as DIF in the Rasch model.

The most dramatic finding concerns family support (I15), which shows the largest DIF range across age groups (.90 logits), with the oldest group (≥ 23 years) showing the lowest DIF score (−1.531), indicating they endorse this item far less than expected given their overall stress level. This pattern likely reflects the developmental trajectory of family dependence across the undergraduate years: for the youngest students (17–18), family remains the primary psychological anchor, and its perceived adequacy is closely coupled with overall stress experience. As students age into their early twenties and particularly as they approach graduation, identity development processes that are normative in late adolescence and emerging adulthood, theorized within Islamic educational psychology as the consolidation of *syakhsiyah islamiyah* (Islamic identity), produce increased psychological independence from parental scaffolding, so that family support becomes a less direct moderator of stress appraisal (Aprilianti, 2024; Dzikra et al., 2025).

The youngest group's elevated DIF measures for procrastination (I23) and time management difficulty (I25) are consistent with well-documented adjustment stress in the secondary-to-tertiary transition period, where students newly encountering the self-regulated, autonomous academic demands of university struggle disproportionately with time management relative to their overall stress level (Zamroni et al., 2019). This is precisely the developmental moment where proactive time management interventions, grounded in Islamic principles of *amanah* (trustworthiness and responsibility) and disiplin (discipline), would have the greatest preventive impact (Agustin & Hidayah, 2024; Triyuliasari et al., 2025).

Semester-Based DIF: Academic Stage and Shifting Stress Profiles

The semester-based DIF findings reveal a complementary picture of how academic stress appraisal evolves across the curriculum. The largest DIF ranges, sleep difficulties I18 (range = .63, highest in 6th semester), parental expectations I7 (.61, highest in 4th semester), and study-life balance I4 (.55, highest in 2nd semester), suggest that different components of the academic stress experience are amplified at different academic stages, a pattern that aligns with stress inoculation theory (Maddi, 2013) and with the developmental counseling frameworks used in Indonesian Islamic higher education guidance services (Basri et al., 2025).

Early-semester students (2nd semester) show elevated DIF measures for study-life balance disruption (I4), peer competition (I8), and procrastination (I23), all consistent with the initial adjustment demands of transitioning to university-level academic expectations and the social pressures of establishing peer identity within the campus community. The finding that anxiety items (I16, range = .47) are most strongly endorsed in the 2nd semester aligns with Zamroni et al. (2018) Zamroni et al. (2019) documentation of first-year students as the highest-stress subpopulation in PTKI. It suggests that early-semester anxiety has a disproportionate relationship with overall stress that recedes as students develop regulatory capacity.

By mid-curriculum (4th–6th semesters), the stress profile shifts toward relational and somatic dimensions: parental expectations (I7) peak in the 4th semester, suggesting that sophomore students face intensified family pressure to demonstrate academic progress before the midpoint of their studies. Sleep difficulties (I18) peak in the 6th semester, consistent with the increased thesis preparation and research demands that characterize this academic stage in the Indonesian curriculum. Senior students (8th semester and above) show elevated DIF for career worry (I9), family support (I15), peer support (I11), and time management efficacy deficits (I21, I22), a profile consistent with the convergent pressures of approaching graduation, thesis completion, and post-graduation uncertainty characteristic of Indonesian Islamic higher education students in their final semesters (Irfan et al., 2024; Oktarosada et al., 2025).

Residential DIF: The Paradox of Dormitory Students and Family Support

The finding that dormitory residents endorsed I15 (my family supports me in facing academic challenges) more strongly than expected, given their overall stress level (ES = .49, moderate DIF), is counterintuitive but theoretically coherent. Students living away from their families in dormitory settings, predominantly in Islamic boarding houses (*pesantren*-style dormitories) at these three institutions, may idealize family support as a compensatory psychological mechanism when physical proximity to family is absent. This pattern is consistent with the buffering function of perceived social support in the stress-coping literature: perceived support exerts its protective effect through cognitive appraisal rather than through actual supportive transactions, and distance may paradoxically enhance idealized perceptions of support availability (Kobasa, 1979; Lazarus & Folkman, 1985).

An alternative interpretation rooted in Islamic educational psychology is that dormitory students, who are more immersed in the Islamic learning environment and collective tarbiyah culture of the *pesantren* system, may have developed a broader, more spiritually integrated

conception of "family support" that encompasses their *ustadz-ustadzah*, peers, and the dormitory community itself as functional family substitutes, effectively inflating their endorsement of the family support item relative to its intended referent (Agustin & Hidayah, 2024; Akip et al., 2025; Elfattah, 2025; Muslikah et al., 2026). It can also be understood as a form of compensatory idealization or a reflection of strengthened kinship bonds when individuals are far from home, effectively functioning as a "spiritual resource" for coping with stress. Both interpretations suggest that residential counseling programs at Islamic higher education institutions should attend to the distinct support appraisal structures of dormitory students rather than treating them as comparable to students living at home.

Dormitory students' elevated endorsement of procrastination (I23, ES = .36) relative to students in rented accommodation may reflect the structured daily rhythms of Islamic dormitories, with obligatory prayer schedules, communal study sessions, and curfews, that paradoxically create more salient awareness of procrastination as a failure to meet self-imposed or community-imposed academic productivity norms. The social visibility of study behavior in dormitory settings, where peers can directly observe avoidance behavior, may amplify the experienced salience of procrastination as a stressor.

Integration: DIF, Islamic Resilience, and Fair Measurement

Viewed collectively, the DIF findings across all four demographic variables converge on a theoretically coherent narrative: academic stress, as measured by this instrument, is not a psychologically uniform construct that manifests identically across demographic contexts within Indonesian Islamic higher education. The variation captured by DIF is not purely a measurement artifact; much of it reflects genuine differences in how stress is experienced, expressed, and moderated by the spiritual, relational, and developmental resources available to different student subgroups. This is precisely what the transactional model of stress (Lazarus & Folkman, 1984) predicts: stress appraisal is inherently context-dependent, and in an Islamic educational environment, that context includes not only socioeconomic and developmental factors but also the spiritual capital accumulated through religious practice and education.

The Islamic resilience resources documented in the literature, *tawakal*, *sabar*, *syukur*, *ikhlas*, and *dhikr*, are not equally distributed or equally activated across the demographic subgroups examined in this study. Senior students may have had more years to develop spiritual coping resources; dormitory students may have more intensive exposure to structured Islamic practice; female students may have developed different spiritual expression patterns than male students (Fadheela & Fakhriya, 2024; Nasrin, 2025; Raharjo, 2025; Wahyuni et al., 2024). These differences in spiritual capital translate, through the mechanism of secondary stress appraisal, into different item response patterns across the scale, which is why DIF appears not as random error but as systematically patterned non-equivalence. Far from undermining the scale's validity, this finding argues for a more sophisticated assessment approach that treats demographic background and spiritual resource availability as moderators of stress measurement rather than simply as demographic controls (Dubey et al., 2024; Schwarz, 2018; Sumaiya et al., 2025).

Implications

For counseling practitioners

DIF findings require a fundamental shift in how stress scores are used clinically. Female students systematically underendorse help-seeking items relative to their actual stress level, meaning score-threshold referrals will systematically miss genuinely distressed women. Active outreach and gender-sensitive screening are therefore necessary, not optional. Counseling services should also be developmentally staged: early semesters warrant time management and anxiety programming; mid-curriculum sessions should address somatic complaints and

relational pressures; senior-year services should target thesis stress and post-graduation uncertainty. Across all stages, Islamic spiritual resources (*tawakal*, *sabar*, *dhikr*, *syukur*) should be integrated as structurally constitutive elements of intervention rather than cultural add-ons, calibrated to students' developmental stage and residential context (Dzikra et al., 2025; Fadheela & Fakhriya, 2024; Wahyuni et al., 2024).

For instrument developers

The convergent misfit and DIF concentrated in the Social and Academic Support dimension, affecting all five of its items, signal a construct validity problem rather than isolated item noise. Perceived social support in PTKI contexts functions as a context-sensitive, spiritually moderated resource rather than a stable stress component, producing systematic non-equivalence across subgroups. Future instruments should treat support adequacy as a distinct measurement domain, develop DIF-adjusted scoring for affected items, and incorporate spiritual coping variables as explicit moderators in scale administration (Akip et al., 2025; Qudsyi & Fadlillah, 2025).

For institutional counseling policy

Three priorities follow from the data. Dormitory counseling requires dedicated programming, as residents exhibit a distinctive stress appraisal structure, elevated perceived family support, alongside heightened procrastination, which generic instruments and services do not adequately capture. The person distribution, with a mean above the item mean and a tail reaching 3.88 logits, indicates a meaningful minority experiencing extreme stress for which current campus services are likely insufficient; expanded psychological support at the three study institutions is warranted. Finally, spiritual resilience programming grounded in *tarbiyah* principles, structured *dhikr*, Islamic psychoeducation, and *tawakal*-based cognitive reframing should be embedded in routine prevention curricula rather than treated as supplementary to the counseling model (Aryani & Rahman, 2025; Triyuliasari et al., 2025).

Limitations and Future Directions

Several limitations of the present study should be acknowledged when interpreting its findings. The sample was drawn from three institutions in Bengkulu and South Sumatra provinces, limiting generalizability to the broader diversity of Indonesian Islamic higher education across different regions, institutional types, and cultural contexts. The disproportionate representation of female participants (76.1%) and the small dormitory subsample ($n = 48$) may have reduced statistical power for sex- and residence-based DIF analyses, potentially masking additional DIF effects or inflating effect size estimates for the residential comparison. Additionally, the cross-sectional design precludes causal or longitudinal interpretation of the semester-based DIF patterns documented here; a longitudinal design tracking the same cohort across semesters would more rigorously test whether the observed developmental trajectories in stress appraisal reflect within-person change rather than cohort differences. Finally, DIF findings require cross-validation in independent samples before item revision, removal, or DIF-adjusted scoring procedures are implemented in practice; future research should also examine whether spiritual coping variables, such as *tawakal* orientation, *dhikr* frequency, and Islamic identity strength, moderate DIF patterns in the Social and Academic Support dimension, which would provide a theoretically grounded basis for the subgroup-specific assessment protocols recommended in this study.

CONCLUSION

This study demonstrated that the 25-item academic stress scale possesses adequate psychometric properties for group-level research and population screening in Indonesian

Islamic higher education, as evidenced by ordered rating scale categories, acceptable item fit for 21 of 25 items, satisfactory person–item targeting, and reliable measurement indicators. However, DIF analysis revealed meaningful item-level non-equivalence across sex, age group, semester, and living arrangement, particularly for items measuring social and institutional support, anxiety expression, and help-seeking behavior. These patterns reflect both genuine differences in how academic stress is experienced across demographic subgroups, shaped by developmental stage, gender socialization, and spiritual coping resources, and potential measurement bias in institutional support items that warrant scale revision. Collectively, the findings underscore that fair measurement of academic stress in PTKI contexts requires more than psychometric adequacy at the overall scale level; it demands attention to item-level functioning across the diverse student populations these instruments are intended to serve. DIF analysis, as demonstrated here, provides a principled and practically actionable framework for achieving that standard, and its systematic adoption in Indonesian Islamic higher education counseling research would meaningfully advance both the rigor and the equity of psychological assessment in this context.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the participating institutions: IAIN Curup, UIN Fatmawati Sukarno Bengkulu, and UIN Al-Azhaar Lubuk Linggau, for their support in facilitating data collection. Appreciation is also extended to the students who generously contributed their time and responses to this study. The authors further acknowledge the contributions of experts and reviewers who provided valuable feedback during the instrument development and validation process, which significantly enhanced the quality of this research. This publication was supported by the *Beasiswa Pendidikan Indonesia (BPI)* – Indonesian Education Scholarship, the *Pusat Pembiayaan dan Asesmen Pendidikan Tinggi (PPAPT)* – Center for Higher Education Funding and Assessment, and the *Lembaga Pengelola Dana Pendidikan (LPDP)* – Indonesian Endowment Fund for Education.

AUTHOR CONTRIBUTION STATEMENT

DHR: contributed to the conceptualization of the research problem, determination of the theoretical framework, instrument development, data collection coordination, and review of the final manuscript. AS: contributed to the conceptualization and design of the study, data processing and psychometric analysis using the Rasch Rating Scale Model, interpretation of Differential Item Functioning findings, drafting of the manuscript, critical revision of all manuscript sections, and preparation of the final submission. IW: contributed to the conceptualization of the Islamic higher education context, review of the theoretical framing, and critical feedback on successive manuscript drafts.

REFERENCES

- Agustin, M., & Hidayah, U. (2024). Optimalisasi Pendidikan Islam dalam Meningkatkan Kesejahteraan Mental Serta Mengurangi Burnout di Kalangan Pelajar. *Al-Qalam: Jurnal Kajian Islam dan Pendidikan*. <https://doi.org/10.47435/al-qalam.v16i2.3282>
- Akip, M., Yunus, M., & Sujarwo, S. (2025). Keterkaitan Antara Pendidikan Agama Islam Dengan Pemahaman Konsep Kesehatan Mental Siswa. *ej*. <https://doi.org/10.37092/ej.v7i2.997>
- Al, K., Rachmat, F., Aziz, M. F., Innayah, S. F., & Rahmatullah, Y. (2025). Kecemasan Akademik dalam Perspektif Mahasiswa Muslim. *IHSANIKA : Jurnal Pendidikan Agama Islam*. <https://doi.org/10.59841/ihsanika.v3i2.2721>

- Andrich, D. (1978). A rating formulation for ordered response categories. *Psychometrika*, 43(4), 561-573. <https://doi.org/10.1007/BF02293814>
- Aprilianti, E. (2024). Integrating Islamic Psychological Principles in Enhancing Students' Academic Resilience. *Nusantara Journal of Behavioral and Social Sciences*. <https://doi.org/10.47679/202246>
- Aryani, P. L., & Rahman, R. (2025). Psikologi Pendidikan Islam Sebagai Solusi Untuk Mengatasi Stres Akademik Mahasiswa PAI Universitas Negeri Padang. *Tazakka: Jurnal Pendidikan dan Keislaman*. <https://doi.org/10.24036/tazakka.v3i01.132>
- Basri, H., Hidayat, A., Hasibuan, H. R., & Rahman, Z. A. (2025). The Ability of Islamic Religious Education Study Program Students in Overcoming Academic Stress Problems at Universitas Islam Negeri Sumatera Utara Medan. *Permata : Jurnal Pendidikan Agama Islam*. <https://doi.org/10.47453/permata.v6i1.3070>
- Bond, T. G., Yan, Z., & Heene, M. (2021). *Applying the Rasch Model: Fundamental Measurement in the Human Sciences* (Vol. 4th Edition). Routledge.
- Csobanka, Z. E. (2016). The Z generation. *Acta Educationis Generalis*, 6(2), 63-76.
- Dubey, M., Ghosh, R., Das, G., Roy, D., Das, S., Chakraborty, A., Chatterjee, S., Dubey, S., & Benito-León, J. (2024). Beyond Belief and Practice: An Exploratory Literature Review and Discussion of the Differential Impact of Spirituality and Religiosity on Mental Health Disorders. *Journal of Religion and Health*, 64, 1876-1889. <https://doi.org/10.1007/s10943-024-02090-9>
- Dzikra, O. C., Umayah, U., Meidyansyah, R., Zubaidah, Z., Adam, Y., & Iloakasia, A. J. (2025). Islamic Spirituality based Self-guidance Model for Managing Stress among Working College Students. *Al-Musyrif: Jurnal Bimbingan dan Konseling Islam*. <https://doi.org/10.38073/almusyrif.v8i1.2502>
- Elfattah, H. Y. A. (2025). Faith-Based Mental Health Promotion in Muslim Communities: The Role of Islamic Education and Spiritual Practices. *Sinergi International Journal of Islamic Studies*. <https://doi.org/10.61194/ijis.v3i1.709>
- Fadheela, A., & Fakhriya, F. (2024). The Effectiveness of Controlled Dhikr-Based Islamic Counseling in Reducing Students' Academic Anxiety. *Journal on Islamic Studies*. <https://doi.org/10.35335/qyth1f48>
- Gadzella, B. M. (1994). Student-life stress inventory: Identification of and reactions to stressors. *Psychological reports*, 74(2), 395-402. <https://doi.org/https://doi.org/10.2466/pr0.1994.74.2.395>
- Irfan, A., Choeroni, & Muchtar, A. (2024). Factors Contributing to Academic Stress among Islamic Education Masters Students in the Class of 2024 at Sultan Agung Islamic University. *Jurnal Pendidikan Penggerak*. <https://doi.org/10.35870/jpp.v2i2.4001>
- Iskandar, I., Bakar, A. Y. A., Defrianti, D., & Setiawan, M. (2024). Emotion regulation and gender as the key predictors of academic stress among STEM students in Islamic universities. *Cogent Psychology*, 11. <https://doi.org/10.1080/23311908.2024.2406640>
- Kobasa, S. C. (1979). Stressful life events, personality, and health: an inquiry into hardiness. *Journal of personality and social psychology*, 37(1), 1.
- Lazarus, R., & Folkman, S. (1985). Stress and coping. *New York*, 18(31), 34-42.
- Linacre, J. M. (2022). R Statistics: survey and review of packages for the estimation of Rasch models. *International journal of medical education*, 13, 171.
- Maddi, S. R. (2013). *Turning stressful circumstances into resilient growth*. Springer.
- Millsap, R. E. (2012). *Statistical approaches to measurement invariance*. Routledge.
- Moore, C. M., & Dorn, M. A. (2026). A step-by-step guide for assessing DIF Using the Rasch model. *Measurement and Evaluation in Counseling and Development*, 59(2), 176-193. <https://doi.org/https://doi.org/10.1080/07481756.2025.2601578>

- Muslikah, M., Sugiharto, D. Y. P., Mahfud, A., Sofyan, A., Endalan, L. M., & Prabawa, A. F. i. (2026). The Effectiveness of Character Strengths-Based Peer Counseling in Fostering Psychological Well-Being in Islamic Boarding Schools. *Islamic Guidance and Counseling Journal*, 9(1). <https://doi.org/https://doi.org/10.25217/0020258725000>
- Nasrin, M. I. (2025). The Influence of Islamic Spiritual Values on Students' Mental Health: A Special Focus on Tawakkul (توكل), Sabr (صبر) and Shukr (شكر). *LECTURES: Journal of Islamic and Education Studies*. <https://doi.org/10.58355/lectures.v4i2.150>
- Oktarosada, D., Fadilah, N., & Sativa, O. (2025). Kesehatan Mental Mahasiswa dalam Perspektif Islam: Menyikapi Tugas, Tuntutan, dan Tekanan Sosial Dengan Keteguhan Iman. *Reslaj: Religion Education Social Laa Roiba Journal*. <https://doi.org/10.47467/reslaj.v7i10.9241>
- Putra, S. D. (2015). Uji Validitas Konstruk pada Instrumen Student-Life Stress Inventory dengan Metode Confirmatory Factor Analysis. *Jurnal Penelitian dan Pengukuran Psikologi Indonesia (JP3I)*, 4(3), 1-11. <https://doi.org/https://doi.org/10.15408/jp3i.v4i3.9298>
- Qudsyi, H., & Fadlillah, D. F. (2025). The Power of Surrender: The Role of Tawakal in Building Academic Resilience among Indonesian High School Students. *Education Policy and Development*. <https://doi.org/10.31098/epd.v3i2.3414>
- Raharjo, S. (2025). The Influence of Islamic Education Learning on Strengthening University Students' Mental Health at Public Higher Education Institutions. *International Journal for Science Review*. <https://doi.org/10.71364/ijfsr.v2i5.42>
- Rouquette, A., Hardouin, J.-B., Vanhaesebrouck, A., Sébille, V., & Coste, J. (2019). Differential Item Functioning (DIF) in composite health measurement scale: Recommendations for characterizing DIF with meaningful consequences within the Rasch model framework. *PloS one*, 14(4), e0215073. <https://doi.org/https://doi.org/10.1371/journal.pone.0215073>
- Schwarz, S. (2018). Resilience in psychology: A critical analysis of the concept. *Theory & Psychology*, 28, 528-541. <https://doi.org/10.1177/0959354318783584>
- Seemiller, C., & Grace, M. (2016). *Generation Z goes to college*. John Wiley & Sons.
- Sumaiya, B., Anas, N., & Aziz, E. (2025). Spirituality and Mental Well-being: Designing a Holistic Educational Framework for Psycho-spiritual Resilience. *Asian Journal of Education and Social Studies*. <https://doi.org/10.9734/ajess/2025/v51i72198>
- Tennant, A., & Küçükdeveci, A. A. (2023). Application of the Rasch measurement model in rehabilitation research and practice: early developments, current practice, and future challenges. *Frontiers in Rehabilitation Sciences*, 4, 1208670. <https://doi.org/https://doi.org/10.3389/fresc.2023.1208670>
- Triyuliasari, A., Ni'matuzahroh, & Anwar, Z. (2025). Stress Management Strategies to Reduce Academic Stress in Modern Islamic Boarding School Students. *Al-Hayat: Journal of Islamic Education*. <https://doi.org/10.35723/ajie.v9i2.201>
- Twenge, J. M. (2017). The costs of overprotecting the young-iGen: why today's super-connected kids are growing up less rebellious, more tolerant, less happy-and completely unprepared for adulthood-and what that means for the rest of Us. *Journal of Psychology*, 1-13. <https://doi.org/https://doi.org/10.5406/amerjpsyc.132.1.0115>
- Wahyuni, S., Munthe, R. A., & Fadilla, S. E. (2024). Increasing Students' Psychological Well-Being and Academic Resilience Through Cognitive-Behavioral Intervention and Mindfulness Relaxation Integrated with Islamic Values. *Psikis : Jurnal Psikologi Islami*. <https://doi.org/10.19109/psikis.v10i2.22610>
- Zamroni, Z., Hidayah, N., Ramli, M., & Hambali, I. (2018). Prevalence of Academic Stress Among Medical and Pharmaceutical Students. *European Journal of Education Studies*. <https://doi.org/10.46827/ejes.v0i0.1824>

- Zamroni, Z., Hidayah, N., Ramli, M., & Hambali, I. (2019). Academic stress and its sources among first year students of islamic higher education in Indonesia. *International Journal of Innovation, Creativity and Change*, 5(4), 535-551. https://doi.org/https://www.ijicc.net/images/vol5iss4/Pt_2/54210_Zamroni_2019_E_R.pdf
- Zwick, R., Thayer, D. T., & Lewis, C. (1999). An empirical Bayes approach to Mantel-Haenszel DIF analysis. *Journal of Educational Measurement*, 36(1), 1-28. <https://doi.org/https://doi.org/10.1111/j.1745-3984.1999.tb00543.x>

Copyright holder:

© Author/s (2026)

First publication right:

Islamic Guidance and Counseling Journal

This article is licensed under:

CC-BY-SA

Appendix A. Blueprint of the Academic Stress Scale

Item	Dimension	Item Statement (Indonesian)	Item Statement (English Translation)
Dimension 1: Academic Workload (Beban Akademik)			
I1	Academic Workload	Saya merasa terbebani dengan banyaknya tugas dan tanggung jawab akademik.	<i>I feel overwhelmed with the number of tasks and academic responsibilities.</i>
I2	Academic Workload	Tugas-tugas akademik yang diberikan sering kali terlalu banyak untuk diselesaikan tepat waktu.	<i>Academic tasks given are often too many to complete on time.</i>
I3	Academic Workload	Saya merasa cemas tentang kemampuan saya untuk memenuhi tuntutan akademik.	<i>I feel anxious about my ability to meet academic demands.</i>
I4	Academic Workload	Beban studi saya mengganggu keseimbangan hidup saya.	<i>My study load disrupts my life balance.</i>
I5	Academic Workload	Saya sering merasa lelah karena banyaknya tugas akademik yang harus diselesaikan.	<i>I often feel tired due to the many academic tasks that must be completed.</i>
Dimension 2: Academic Pressure (Tekanan Akademik)			
I6	Academic Pressure	Saya merasa tertekan untuk mendapatkan nilai yang tinggi dalam setiap mata kuliah.	<i>I feel pressured to achieve high grades in every course.</i>
I7	Academic Pressure	Ekspektasi dari orang tua mengenai prestasi akademik saya sangat tinggi.	<i>My parents' expectations regarding my academic achievements are very high.</i>
I8	Academic Pressure	Saya merasa bersaing secara tidak sehat dengan teman-teman untuk mendapatkan nilai terbaik.	<i>I feel in unhealthy competition with peers to get the best grades.</i>
I9	Academic Pressure	Saya khawatir tentang masa depan karir saya jika tidak mendapatkan nilai yang baik.	<i>I worry about my career future if I do not get good grades.</i>
I10	Academic Pressure	Standar akademik di perguruan tinggi terlalu tinggi untuk dicapai.	<i>Academic standards at the university are too high to achieve.</i>
Dimension 3: Social and Academic Support (Dukungan Sosial dan Akademik)			
I11	Social & Academic Support	Saya merasa memiliki cukup dukungan dari teman-teman dalam menghadapi stres akademik.	<i>I feel I have sufficient support from friends in dealing with academic stress.</i>
I12	Social & Academic Support	Dosen dan staf pengajar sangat mendukung dan membantu dalam mengatasi masalah akademik.	<i>Lecturers and teaching staff are very supportive in resolving academic problems.</i>
I13	Social & Academic Support	Saya merasa nyaman mencari bantuan dari konselor kampus ketika mengalami stres akademik.	<i>I feel comfortable seeking help from a campus counselor when experiencing academic stress.</i>
I14	Social & Academic Support	Kampus saya menyediakan sumber daya yang cukup untuk membantu mengelola stres akademik.	<i>My campus provides sufficient resources to help manage academic stress.</i>
I15	Social & Academic Support	Keluarga saya mendukung saya dalam menghadapi tantangan akademik.	<i>My family supports me in facing academic challenges.</i>
I16	Mental & Physical Health	Saya sering merasa cemas atau stres yang berlebihan terkait dengan studi saya.	<i>I often feel excessive anxiety or stress related to my studies.</i>
I17	Mental & Physical Health	Stres akademik berdampak negatif pada kesehatan fisik saya, seperti sakit kepala atau gangguan tidur.	<i>Academic stress negatively affects my physical health, such as headaches or sleep disturbances.</i>
I18	Mental & Physical Health	Saya kesulitan tidur karena memikirkan tugas-tugas akademik yang belum selesai.	<i>I have difficulty sleeping because I am thinking about unfinished academic tasks.</i>
I19	Mental & Physical Health	Saya mudah marah atau frustrasi karena tekanan akademik.	<i>I easily get angry or frustrated due to academic pressure.</i>
I20	Mental & Physical Health	Saya sering merasa kewalahan dengan jumlah pekerjaan yang harus dilakukan.	<i>I often feel overwhelmed by the volume of work that needs to be done.</i>
Dimension 5: Time Management and Study Skills (Manajemen Waktu dan Keterampilan Belajar)			
I21	Time Management & Study Skills	Saya merasa kesulitan dalam mengatur waktu untuk menyelesaikan semua tugas akademik.	<i>I find it difficult to manage my time to complete all academic tasks.</i>
I22	Time Management & Study Skills	Saya merasa tidak memiliki keterampilan belajar yang efektif untuk menghadapi tuntutan akademik.	<i>I feel I do not have effective study skills to meet academic demands.</i>
I23	Time Management & Study Skills	Saya sering menunda-nunda pekerjaan akademik hingga mendekati batas waktu.	<i>I often procrastinate on academic work until close to the deadline.</i>
I24	Time Management & Study Skills	Saya kesulitan fokus dan berkonsentrasi saat belajar.	<i>I have difficulty focusing and concentrating when studying.</i>
I25	Time Management & Study Skills	Saya perlu meningkatkan kemampuan manajemen waktu saya untuk mengurangi stres akademik.	<i>I need to improve my time management skills to reduce academic stress.</i>

Note. Item statements in Indonesian are as originally administered. English translations are provided for reporting purposes. Response scale: 1 (Sangat Tidak Setuju/Strongly Disagree) to 5 (Sangat Setuju/Strongly Agree).

Appendix B

Item Fit Statistics from Rasch Rating Scale Model Analysis ($N = 401$)

Item	Content	Measure (logit)	SE	Infit		Outfit		r_{ptm}
				MNSQ	ZSTD	MNSQ	ZSTD	
Academic workload								
I1	Overwhelmed by tasks and responsibilities	.26	.05	.72	−4.69	.72	−4.64	.62
I2	Too many tasks to finish on time	−.01	.05	.72	−4.63	.72	−4.72	.64
I3	Anxious about meeting academic demands	−.17	.05	.79	−3.42	.78	−3.53	.67
I4	Study load disrupts life balance	.79	.05	.87	−2.07	.88	−1.93	.62
I5	Often tired from academic tasks	−.32	.05	.67	−5.64	.65	−5.87	.70
Academic pressure								
I6	Pressured to achieve high grades	.29	.05	.81	−3.04	.83	−2.82	.64
I7	High parental expectations for performance	−.36	.06	1.34	4.61	1.55	6.96	.44
I8	Unhealthy competition with peers for grades	1.19	.05	1.35	5.00	1.36	4.88	.46
I9	Worried about career if grades are poor	−.34	.05	1.19	2.66	1.15	2.18	.60
I10	Academic standards are too high to achieve	.46	.05	.64	−6.32	.64	−6.33	.62
Social and academic support								
I11	Sufficient peer support in managing stress	−.27	.05	1.47	6.20	1.61	7.73	.15
I12	Lecturers support academic problem-solving	−.16	.05	1.17	2.49	1.21	2.94	.12
I13	Comfortable seeking campus counselor help	.25	.05	1.27	3.86	1.42	5.70	.05
I14	Campus resources adequate for stress management	.27	.05	1.31	4.30	1.37	5.13	.09
I15	Family supports facing academic challenges	−.79	.06	1.58	7.22	1.95	9.90	.14
Mental and physical health								
I16	Excessive anxiety related to study	−.07	.05	.80	−3.17	.79	−3.30	.71
I17	Academic stress affects physical health	−.46	.06	1.00	.01	.97	−.37	.65
I18	Sleep difficulties due to unfinished tasks	−.37	.06	.98	−.33	.96	−.64	.65
I19	Easily irritable due to academic pressure	.26	.05	.84	−2.64	.84	−2.64	.67
I20	Overwhelmed by volume of work	−.12	.05	.69	−5.32	.69	−5.14	.67
Time management and study skills								
I21	Difficulty organizing time for all tasks	.04	.05	.77	−3.81	.78	−3.62	.62
I22	Lack effective study skills for demands	.26	.05	.87	−2.06	.91	−1.42	.53
I23	Procrastinates academic work until deadlines	.13	.05	1.18	2.66	1.21	3.03	.43
I24	Difficulty focusing and concentrating	.19	.05	.92	−1.20	.97	−.46	.48
I25	Need to improve time management skills	−.94	.06	1.11	1.53	1.05	.63	.43

Note. Measure = item difficulty in log-odds units (logits); *SE* = standard error; MNSQ = mean square fit statistic; ZSTD = standardized fit statistic; r_{ptm} = point-measure correlation. Acceptable fit range: infit and outfit MNSQ 0.6–1.4 (Bond et al., 2021). Items in *italics* indicate misfit to the model (outfit MNSQ > 1.4). Item content represents abbreviated English translations of the original Indonesian items.

Appendix C

Summary of Differential Item Functioning (DIF) by Demographic Group

Item	Content	ES	<i>t</i>	<i>p</i>	DIF _{high}	DIF _{low}	Dim.
		(logit)			Favored group	Disfavored group	
<i>Sex (male vs. female; Rasch-Welch <i>t</i>, <i>p</i> < .05, ES ≥ .10)</i>							
I3	Anxious about meeting academic demands	.30	2.39	.018	Female	Male	AW
I9	Worried about career if grades are poor	.33	2.60	.010	Female	Male	AP
I13	Comfortable seeking campus counselor	.36	-2.89	.004	Male	Female	SS
I14	Campus resources adequate for stress	.31	-2.50	.013	Male	Female	SS
I17	Academic stress affects physical health	.32	2.49	.014	Female	Male	MH
I23	Procrastinates academic work until deadlines	.33	-2.67	.009	Male	Female	TM
I24	Difficulty focusing and concentrating	.31	-2.50	.013	Male	Female	TM

Item	Content	17–18	19–20	21–22	≥23	Range	Dim.
<i>Age group (17–18, 19–20, 21–22, ≥23 years; DIF measure range ≥ .30 logits)^a</i>							
I2	Too many tasks to finish on time	.207	.044	-.144	.077	.35	AW
I4	Study load disrupts life balance	.964	.775	.722	1.319	.60	AW
I5	Often tired from academic tasks	-.242	-.354	-.374	.279	.65	AW
I6	Pressured to achieve high grades	.170	.308	.263	.588	.42	AP
I9	Worried about career if grades poor	-.319	-.399	-.342	-.016	.38	AP
I10	Academic standards too high	.207	.471	.465	.605	.40	AP
I11	Sufficient peer support in stress	-.093	-.374	-.170	-.456	.36	SS
I12	Lecturers support problem-solving	-.319	-.058	-.177	-.864	.81	SS
I13	Comfortable seeking campus counselor	-.091	.230	.428	-.395	.82	SS
I14	Campus resources adequate for stress	.096	.296	.359	-.338	.70	SS
I15	Family supports academic challenges	-.993	-.825	-.631	-1.531	.90	SS
I16	Excessive anxiety related to study	-.016	-.087	-.133	.365	.50	MH
I19	Easily irritable due to pressure	.318	.213	.286	.520	.31	MH
I21	Difficulty organizing time for tasks	.095	-.025	.089	.303	.33	TM
I23	Procrastinates until deadlines	.392	.179	.024	.048	.37	TM
I24	Difficulty focusing/concentrating	-.099	.248	.147	.462	.56	TM
I25	Need to improve time management	-.683	-.884	-1.051	-1.391	.71	TM

Semester (2nd, 4th, 6th, 8th and above; DIF measure range ≥ .30)^a

Item	Content	ES	<i>t</i>	<i>p</i>	DIF _{high}	DIF _{low}	Dim.
		(logit)			Favored group	Disfavored group	
I1	Overwhelmed by tasks and responsibilities	.52	—	—	8th+	6th	AW
I4	Study load disrupts life balance	.55	—	—	2nd	8th+	AW
I7	High parental expectations for performance	.61	—	—	4th	8th+	AP
I8	Unhealthy competition with peers	.32	—	—	2nd	6th	AP
I9	Worried about career if grades are poor	.38	—	—	8th+	2nd	AP
I11	Sufficient peer support in managing stress	.32	—	—	8th+	4th	SS
I13	Comfortable seeking campus counselor	.36	—	—	6th	2nd	SS
I15	Family supports facing academic challenges	.58	—	—	8th+	2nd	SS
I16	Excessive anxiety related to study	.47	—	—	2nd	8th+	MH
I17	Academic stress affects physical health	.30	—	—	6th	8th+	MH
I18	Sleep difficulties due to unfinished tasks	.63	—	—	6th	8th+	MH
I21	Difficulty organizing time for all tasks	.39	—	—	8th+	4th	TM
I22	Lack effective study skills for demands	.41	—	—	8th+	4th	TM
I23	Procrastinates academic work until deadlines	.44	—	—	2nd	6th	TM
I24	Difficulty focusing and concentrating	.35	—	—	4th	2nd	TM
I25	Need to improve time management skills	.57	—	—	4th	8th+	TM

Item	Content	ES	<i>t</i>	<i>p</i>	DIF _{high}	DIF _{low}	Dim.
		(logit)			Favored group	Disfavored group	
Current residence (family, rented room, dormitory; Rasch-Welch <i>t</i>, <i>p</i> < .05, <i>ES</i> ≥ .10)							
I15	Family supports facing academic challenges	.49	2.40	.019	Dormitory	Family	SS
I23	Procrastinates academic work until deadlines	.36	2.10	.039	Dormitory	Rented	TM

Note. ES = effect size in logits; for sex and residence, ES = DIF contrast between groups (Rouquette et al., 2019); for age group and semester, ES = DIF measure range across all subgroups (no pairwise *t* available due to small or unequal reference group sizes). DIF_{high} = group with higher DIF measure (endorses item more than expected given stress level); DIF_{low} = group with lower DIF measure. Dim. = scale dimension: AW = academic workload; AP = academic pressure; SS = social and academic support; MH = mental and physical health; TM = time management and study skills. Item content represents abbreviated English translations of the original Indonesian items.

*Rasch-Welch pairwise *t*-tests were not available because Winsteps assigned individual age years (17–34) and individual semester codes (10, 12) as reference groups with *n* = 1 (*df* = 0). DIF measure range across subgroups is reported as the effect size indicator; a threshold of ≥ .30 logits was applied as the criterion for substantive DIF, consistent with three times the two-group standard of .10 logits (Rouquette et al., 2019).