

Examining dual-factor mental health: a confirmatory factor analysis among senior secondary students in Islamic boarding schools

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ABSTRACT

This study examines the measurement properties of the dual-factor model of mental health among senior secondary students in Islamic boarding schools. Despite growing interest in the dual-factor framework, empirical validation in culturally embedded educational settings remains limited. Using a quantitative cross-sectional design, data were collected from 616 students across 10 schools using the Azira Mental Health Scale (AMHS-24), which assesses psychological well-being and psychological distress. Confirmatory factor analysis (CFA) supported a two-factor structure, indicating that well-being and distress are distinct yet related constructs. The model showed acceptable but not optimal fit (root mean square error of approximation (RMSEA)=.055; standardized root mean square residual (SRMR)=.063; comparative fit index (CFI)=.874; Tucker-Lewis index (TLI)=.862). Reliability was satisfactory (α =.855 and .861), and discriminant validity was supported (heterotrait-monotrait (HTMT)=.321). However, convergent validity was limited (average variance extracted (AVE)=.332 and .343). The novelty of this study lies in validating a dual-factor mental health instrument within Islamic boarding schools, providing a contextually grounded assessment of both positive and negative dimensions. Despite this limitation, the findings support the use of the AMHS-24 as a reliable tool for assessing general mental health patterns.

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1. INTRODUCTION

The issue of mental health among students has gained increasing attention in recent years, particularly within educational environments that combine academic demands with structured social and moral expectations. In the context of Islamic boarding schools, students are required to adapt not only to formal learning activities but also to religious practices and communal living arrangements that shape their daily experiences [1], [2]. While these integrated demands may support students' personal growth, they also

create complex psychological pressures that are not always adequately identified or addressed within school systems. In many cases, the assessment of students' mental health still relies heavily on indicators of psychological distress, with limited attention to positive functioning such as well-being, resulting in an incomplete understanding of students' overall mental condition. This limitation may hinder educators' ability to provide appropriate support, potentially affecting students' learning engagement, adjustment, and long-term development. Prior studies have emphasized the complexity of students' psychological experiences in such settings [3], [4]. This complexity highlights the need for a more comprehensive and balanced approach to understanding mental health.

Within this context, the issue of how mental health is conceptualized and measured becomes particularly critical. Contemporary research has increasingly challenged the assumption that mental health can be represented solely by the absence of psychological distress [5], [6]. Instead, scholars have emphasized that mental health encompasses both positive functioning and negative psychological symptoms that may coexist within individuals [7], [8]. This perspective has led to the development of the dual-factor model, which conceptualizes psychological well-being and psychological distress as distinct yet related dimensions. As a conceptual framework, the dual-factor model offers a more comprehensive approach to understanding students' mental health, particularly in complex educational settings [9]–[11]. However, despite its theoretical relevance, the application of this model in educational practice remains limited, as many assessment approaches continue to prioritize psychological distress while overlooking positive dimensions of well-being. This imbalance may result in incomplete identification of students' mental health conditions, thereby constraining the effectiveness of school-based support and intervention strategies.

Despite these conceptual advances, the implementation of the dual-factor model in measurement instruments remains a significant challenge. Many existing tools continue to emphasize psychological distress while providing limited and often insufficient coverage of well-being indicators, resulting in an imbalanced assessment of mental health. Even when both dimensions are included, empirical evidence supporting their distinctiveness and measurement adequacy is not always consistent across studies [12], [13]. In particular, issues related to item-level validity and the strength of construct representation remain underexamined, especially in educational contexts. This limitation is critical, as the absence of robust psychometric evidence may weaken the practical applicability of the dual-factor model in real-world settings. Therefore, there is a clear need for more rigorous validation studies that not only confirm the structural distinction between well-being and distress but also evaluate the quality and adequacy of their measurement indicators.

Empirical studies employing confirmatory factor analysis (CFA) have generally provided support for the two-factor structure of the dual-factor model, with indicators of psychological well-being and psychological distress loading onto separate latent constructs [8], [14], [15]. These findings suggest that the model is structurally plausible across different populations and contexts. However, structural support alone is not sufficient to establish measurement adequacy. Many studies primarily focus on overall model fit while providing limited examination of item-level performance and construct validity. As a result, important aspects such as the strength of factor loadings, convergent validity, and discriminant validity are not always comprehensively evaluated. This limitation indicates that, although the dual-factor model is widely supported at the structural level, further investigation is needed to assess the robustness and quality of its measurement properties, particularly within specific educational and cultural contexts.

Several studies have reported limitations in the measurement of mental health using the dual-factor model, particularly due to the limited availability of instruments that adequately assess both psychological well-being and psychological distress in a balanced manner [16]–[18]. This limitation becomes especially important in Islamic boarding schools, where students experience a combination of academic demands, religious practices, and communal living arrangements that shape their daily psychological experiences. Such environments may influence how mental health is expressed and understood, potentially differing from general school settings [19], [20]. Without context-specific validation, existing instruments may not fully capture the complexity of students' mental health in these environments. Addressing this gap, the present study provides a psychometric evaluation of the dual-factor model within Islamic boarding schools. The novelty of this study lies in validating a dual-factor mental health instrument within a culturally embedded educational environment while demonstrating that psychological well-being and psychological distress remain empirically distinguishable within the context of Islamic boarding schools.

Building on these considerations, the present study aims to evaluate the measurement properties of the dual-factor model of mental health among senior secondary students in Islamic boarding schools. Specifically, the study examines whether the hypothesized two-factor structure, representing psychological well-being and psychological distress, is empirically supported through CFA. In addition, it assesses construct validity and reliability through multiple indicators, including convergent validity, discriminant validity, and internal consistency. Beyond confirming the structural model, this study provides a more

comprehensive psychometric evaluation by examining the quality of item-level indicators and the adequacy of construct representation. The study contributes to the literature in three important ways: i) by offering context-specific validation of the dual-factor model within Islamic boarding school settings; ii) by providing a rigorous evaluation of measurement properties beyond overall model fit; and iii) by advancing the application of culturally grounded mental health assessment in educational research. These contributions are expected to support more accurate identification of students' mental health conditions and inform the development of school-based interventions and policies.

2. METHOD

This study employed a quantitative approach with a cross-sectional design to examine the measurement properties of the dual-factor model of mental health among senior secondary students in Islamic boarding schools. The use of a quantitative framework is appropriate given the objective of evaluating construct validity and reliability through statistical modeling, particularly CFA. The study focuses on assessing the adequacy of a two-factor structure representing psychological well-being and psychological distress as latent constructs. This design enables the systematic examination of relationships between observed indicators and their underlying constructs, thereby providing a rigorous basis for evaluating the psychometric performance of the measurement model.

The study was conducted through a series of systematic procedures designed to ensure transparency and replicability. Initially, the measurement instrument was prepared by adapting items representing psychological well-being and psychological distress into a structured questionnaire format. Data were then collected from students in Islamic boarding schools through coordinated administration, with participants completing the questionnaire under standardized conditions to minimize response bias. Prior to analysis, the collected data were screened to identify incomplete responses and ensure data quality. Ethical considerations were also addressed by informing participants about the purpose of the study and ensuring the confidentiality of their responses. These procedures were implemented to support the validity and integrity of the data used in subsequent analyses.

The study involved 616 students drawn from 10 Islamic boarding schools, representing senior secondary education levels. Participants were selected using a purposive sampling strategy based on predefined inclusion criteria. Specifically, participants were required to be actively enrolled as students in Islamic boarding schools, fall within the senior secondary age range (15–19 years), and be willing to participate in the study under informed consent procedures. The selection of schools was based on accessibility and their representation of typical Islamic boarding school environments, ensuring that the sample reflected the characteristics relevant to the research context. The sample consisted of 287 male students (46.6%) and 329 female students (53.4%), indicating a relatively balanced gender distribution. The participants' ages ranged from 15 to 19 years, with a mean age of 16.35 years, reflecting the typical developmental stage of mid-adolescence in this educational context. The relatively large sample size supports the robustness of CFA by enabling more stable parameter estimation and strengthening the evaluation of the measurement model.

Data collection was carried out using the Azira Mental Health Scale (AMHS-24), a self-developed instrument designed to measure psychological well-being and psychological distress among senior secondary students in Islamic boarding school settings. The development of the instrument was grounded in the dual-factor model of mental health and included initial content validation to ensure the relevance and clarity of the items. The instrument comprises 24 items, divided evenly into two dimensions: psychological well-being (covering positive affect, interpersonal relations, and life satisfaction) and psychological distress (including anxiety, depressive symptoms, and loss of control). Responses were recorded on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree), intentionally excluding a neutral option to better capture participants' subjective evaluations. All responses were obtained anonymously to maintain confidentiality and subsequently compiled into a digital dataset. Prior to analysis, the data were screened to identify missing entries and inconsistent response patterns, thereby ensuring data accuracy and reliability.

To examine the underlying measurement structure, CFA was employed, with the AMHS-24 specified as a two-factor model representing psychological well-being and psychological distress. The analysis was performed using Jeffreys's Amazing Statistics Program (JASP), allowing for the estimation of model parameters and the evaluation of model fit. Parameters were estimated using the maximum likelihood (ML) method, which is commonly applied in CFA for continuous data. Model fit was assessed using multiple indices, including the chi-square statistic (χ^2), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Following commonly accepted guidelines, values of CFI and TLI close to or above .90, RMSEA below .08, and SRMR below .08 were considered indicative of an acceptable model fit. The association between observed indicators and their respective latent variables was evaluated through

standardized factor loadings, which served as evidence of item validity. In addition to overall model fit, construct reliability and convergent validity were assessed using composite measures, including omega coefficient (ω), Cronbach's alpha (α), and average variance extracted (AVE). Discriminant validity was further examined using the heterotrait–monotrait ratio (HTMT), which assesses the empirical distinctiveness between constructs. Prior to conducting the CFA, assumptions related to data adequacy and model identification were reviewed to ensure the robustness of the estimation procedure.

3. RESULTS

This section presents the results of the descriptive analysis and measurement model evaluation. The analysis begins with descriptive statistics and reliability estimates, followed by CFA to assess model fit. Subsequently, the standardized factor loadings for psychological well-being and psychological distress are reported. Finally, convergent and discriminant validity are examined to evaluate the adequacy of the measurement model.

Descriptive statistics were calculated to provide an overview of the study variables. As presented in Table 1, psychological well-being and psychological distress demonstrated moderate variability, indicating that the measures were able to capture differences in participants' mental health conditions. These findings suggest that the instrument was sufficiently sensitive to reflect variation in students' mental health experiences.

Table 1. Descriptive statistics and reliability analysis

Construct	Number of items	Mean	SD	Cronbach's alpha
Psychological well-being	12	38.00	5.96	.855
Psychological distress	12	29.23	7.28	.861

The internal consistency of the two constructs was assessed using Cronbach's alpha. The findings indicate that both psychological well-being ($\alpha=.855$) and psychological distress ($\alpha=.861$) surpassed the commonly accepted threshold of .70, reflecting satisfactory reliability. These results suggest that the items within each construct consistently measured the intended psychological dimensions.

To further examine the measurement structure, a CFA was performed, specifying psychological well-being and psychological distress as two distinct latent variables. The summary of model fit statistics is reported in Table 2. The Chi-square test was significant ($\chi^2=1035.55$, $df=251$, $p<.001$), a result frequently observed in studies with large sample sizes. The values of RMSEA (.055; 90% confidence interval (CI) [.051, .060]) and SRMR (.063) suggest an adequate level of absolute fit. Meanwhile, the incremental fit indices, namely CFI (.874) and TLI (.862), fell slightly below the recommended cutoff of .90, indicating that although the model fit can be considered acceptable, it has not yet reached an optimal level.

Table 2. Model fit

Index	Value	Recommended threshold
χ^2 ($df=251$)	1035.55	—
p-value	<.001	—
CFI	.874	$\geq .90$
TLI	.862	$\geq .90$
RMSEA	.055	$\leq .08$
RMSEA 90% CI	.051–.060	—
SRMR	.063	$\leq .08$

The standardized factor loadings for psychological well-being are presented in Table 3. All items demonstrated acceptable loadings, ranging from .487 to .676, indicating that the items adequately represent the construct. The standardized factor loadings for psychological distress are presented in Table 4. The loadings ranged from .439 to .675, and although a few items showed relatively lower values, all remained above the minimum acceptable threshold, suggesting that the items contributed meaningfully to the measurement of psychological distress.

Convergent and discriminant validity were further examined to evaluate the adequacy of the measurement model. The AVE values for psychological well-being (.332) and psychological distress (.343) were below the recommended threshold of .50, indicating that convergent validity at the item level was not fully established. However, given that the factor loadings were acceptable and reliability indices were satisfactory, the constructs can still be considered adequately measured. Discriminant validity was assessed using the HTMT ratio, with a value of .321, which is well below the recommended threshold of .85. This finding indicates that psychological well-being and psychological distress are empirically distinct constructs.

Table 3. Standardized factor loadings for psychological well-being

Code	Item (English)	Item (Indonesia)	Loading
W1	Feeling that life in the boarding school provides many valuable experiences	<i>Saya merasa kehidupan di pesantren memberi banyak pengalaman berharga</i>	.488
W2	Feeling that the future is full of hope and clear purpose	<i>Saya merasa masa depan saya penuh harapan dan tujuan yang jelas</i>	.535
W3	Feeling calm and able to manage time effectively	<i>Saya merasa tenang dan mampu mengatur waktu dengan baik</i>	.577
W4	Enjoying learning activities and self-development in the boarding school	<i>Saya menikmati setiap kegiatan belajar dan pengembangan diri di pesantren</i>	.623
W5	Feeling valued by peers in the boarding school environment	<i>Saya merasa keberadaan saya dihargai oleh teman-teman di lingkungan pesantren</i>	.616
W6	Feeling comfortable and accepted in social interactions at the boarding school	<i>Saya merasa nyaman dan diterima dalam pergaulan di pesantren</i>	.676
W7	Being able to communicate easily and openly with close friends	<i>Saya mudah berkomunikasi dan terbuka dengan teman-teman dekat</i>	.536
W8	Feeling happy because relationships with friends are going well	<i>Saya merasa senang karena hubungan saya dengan teman-teman berjalan baik</i>	.631
W9	Feeling happy and grateful for one's current life	<i>Saya merasa bahagia dan bersyukur dengan kehidupan saya sekarang</i>	.638
W10	Feeling satisfied with academic results and personal achievements	<i>Saya merasa puas dengan hasil belajar dan pencapaian pribadi saya</i>	.534
W11	Feeling able to accept one's life situation well while maintaining a positive outlook	<i>Saya merasa mampu menerima keadaan hidup saya dengan baik dan tetap berpikir positif</i>	.554
W12	Feeling that life is going well in pursuing goals and improving oneself	<i>Saya merasa kehidupan berjalan dengan baik dalam upaya meraih cita-cita dan memperbaiki diri</i>	.487

Note. All factor loadings are standardized estimates. W1–W12 represent psychological well-being items. The items were conceptually grouped into three subdimensions: positive emotion (PE; items W1–W4), social relationships (SR; items W5–W8), and life satisfaction (LS; items W9–W12). The measurement model was tested as a single latent construct.

Table 4. Standardized factor loadings for psychological distress

Code	Item (English)	Item (Indonesia)	Loading
D1	Feeling nervous before memorization exams or school tests	<i>Merasa gugup sebelum ujian hafalan atau ujian sekolah</i>	.543
D2	Feeling afraid of not meeting teachers' or parents' expectations	<i>Merasa takut tidak dapat memenuhi harapan guru atau orang tua</i>	.559
D3	Feeling worried about being unable to adjust to the boarding school rules	<i>Merasa khawatir tidak mampu menyesuaikan diri dengan aturan pesantren</i>	.571
D4	Feeling uneasy when academic results do not meet expectations	<i>Merasa tidak tenang ketika hasil belajar tidak sesuai harapan</i>	.439
D5	Feeling bored with repetitive boarding school routines	<i>Merasa jenuh dengan rutinitas pesantren yang berulang</i>	.510
D6	Feeling tired and losing motivation to study	<i>Merasa lelah dan kehilangan semangat untuk belajar</i>	.675
D7	Feeling lonely even when surrounded by many peers	<i>Merasa kesepian meskipun berada di tengah banyak teman</i>	.640
D8	Feeling unsure about having a better future	<i>Merasa tidak yakin bahwa masa depan akan menjadi lebih baik</i>	.610
D9	Feeling easily irritated or offended by peers	<i>Merasa mudah marah atau tersinggung terhadap teman</i>	.613
D10	Feeling unable to control time between study, worship, and rest	<i>Merasa sulit mengendalikan waktu antara belajar, ibadah, dan istirahat</i>	.596
D11	Feeling unable to control the pressure to present oneself well in front of teachers or peers	<i>Merasa tidak mampu mengendalikan tekanan untuk selalu tampil baik di hadapan guru atau teman</i>	.602
D12	Feeling unable to control emotions when facing disappointment or failure	<i>Merasa tidak mampu mengendalikan perasaan ketika menghadapi kekecewaan atau kegagalan</i>	.638

Note. All factor loadings are standardized estimates. D1–D12 represent psychological distress items. The items were conceptually grouped into three subdimensions: anxiety (ANX; items D1–D4), depression (DEP; items D5–D8), and loss of control (LC; items D9–D12). The measurement model was tested as a single latent construct.

4. DISCUSSION

The present findings provide support for the dual-factor model of mental health at the structural level. The CFA indicated a clear two-factor structure, and discriminant validity was supported by a low HTMT value, suggesting that psychological well-being and psychological distress are empirically distinct constructs. In addition, both constructs demonstrated strong internal consistency. Although the CFI and TLI values were slightly below the commonly recommended threshold, the acceptable RMSEA and SRMR values suggest that the model remained adequately fit, particularly given the multidimensional and context-sensitive nature of mental health constructs in culturally embedded educational settings. However, the relatively low AVE values indicate that the indicators may capture broad and diverse aspects of mental health rather than highly specific and homogeneous dimensions. Consistent with prior research on the complexity of mental health constructs [21], [22], this suggests that mental health, particularly in complex

educational and socio-religious contexts, may be inherently multifaceted and not easily reduced to highly convergent indicators.

Building on this structural evidence, the findings further reinforce the theoretical foundation of the dual-factor model of mental health, which conceptualizes psychological well-being and psychological distress as two related yet independent continua rather than opposite ends of a single dimension, as widely discussed in the dual-continua framework [7], [23]. Within this perspective, the presence of positive functioning cannot be inferred solely from the absence of psychological difficulties, a distinction that has been consistently emphasized in positive psychology research [15], [23]. The current results extend this line of work by demonstrating that such a dual structure is also evident in the context of Islamic boarding schools, where students navigate both academic demands and value-oriented environments that shape their mental experiences. This indicates that the dual-factor model retains its conceptual relevance across diverse cultural and educational settings.

Despite the clear support for the two-factor structure, a notable tension emerges at the level of measurement properties. While both constructs demonstrated strong internal consistency, as reflected in high omega and Cronbach's alpha values, the relatively low AVE indicates limited convergent validity at the item level [24], [25]. This finding is consistent with previous studies reporting modest AVE values in multidimensional psychological constructs. Such constructs often show acceptable reliability but relatively modest AVE values due to their conceptual breadth. In contrast, studies conducted in more homogeneous populations tend to report higher AVE values. This difference suggests that the heterogeneity of students' experiences in Islamic boarding schools may attenuate item-level convergence. Taken together, these results indicate that the items consistently measure the constructs in a reliable manner, yet do not share a sufficiently high proportion of common variance to demonstrate strong convergence. In other words, the indicators appear to capture related but relatively broad aspects of psychological well-being and distress rather than highly homogeneous dimensions. From a conceptual perspective, this does not necessarily indicate poor measurement quality. Instead, it reflects the inherently multidimensional and context-sensitive nature of mental health constructs in culturally embedded environments.

This pattern may be better understood when considering the specific context of Islamic boarding schools, where students' psychological experiences are often shaped by an integrated system of religious values, communal living, and structured daily routines. Within such environments, emotional states, social relationships, and self-regulation are not necessarily experienced as discrete components but as interconnected aspects of a holistic way of life [26]–[28]. As a result, students may respond to mental health indicators in a more global and undifferentiated manner, which can attenuate the strength of item-level associations while preserving coherence at the construct level. This contextual dynamic helps explain why the dual-factor structure remains intact, even when traditional psychometric criteria for convergent validity are not fully satisfied.

The present study contributes theoretically to the dual-factor model of mental health by extending its application into culturally embedded Islamic boarding school settings. The findings suggest that psychological well-being and psychological distress remain empirically distinguishable even within educational environments characterized by strong communal, religious, and value-oriented structures. In addition, the coexistence of satisfactory reliability and relatively modest convergent validity indicates that multidimensional mental health constructs may reflect broader and more context-sensitive psychological experiences than those typically observed in more homogeneous populations [13], [21]. These findings refine the interpretation of psychometric adequacy within dual-factor mental health research and support the importance of culturally grounded approaches in educational mental health assessment.

From a practical standpoint, the findings suggest that the instrument remains useful for assessing mental health as a broad construct, particularly in distinguishing between psychological well-being and psychological distress in educational settings. This makes it suitable for research purposes that focus on examining relationships between variables, such as regression or structural modeling, where construct-level interpretation is prioritized [16], [24]. However, caution is warranted when using the scale for more fine-grained analysis, especially at the level of specific indicators or subdimensions, given the limited convergent validity observed. In applied contexts, such as student assessment or intervention design, the instrument is therefore better positioned as a screening or profiling tool rather than a precise diagnostic measure.

Several limitations of the present study should be acknowledged to contextualize the findings. The relatively low AVE values indicate that the current set of items may not fully capture the underlying constructs with sufficient precision, suggesting the need for further refinement of the measurement instrument. Future research may consider revising or expanding the item pool to better represent the multidimensional nature of mental health, particularly within culturally specific contexts such as Islamic boarding schools. In addition, alternative modeling approaches, including higher-order or bifactor models, could be explored to examine whether a more nuanced structural representation may improve psychometric

performance [29], [30]. Comparative studies across educational levels, such as junior and senior secondary students, may also provide deeper insights into developmental variations in mental health structure.

5. CONCLUSION

This study provides a comprehensive psychometric evaluation of the dual-factor model of mental health among senior secondary students in Islamic boarding schools. The findings confirm that psychological well-being and psychological distress function as empirically distinct yet complementary dimensions, supporting the dual-factor conceptualization within a culturally embedded educational context. The primary contribution of this study lies in validating the AMHS-24 as a contextually grounded instrument capable of capturing both positive and negative dimensions of mental health in Islamic boarding schools.

Despite these strengths, several limitations should be considered when interpreting the findings. The relatively low AVE values indicate that the indicators may represent broad and multidimensional aspects of mental health rather than highly specific and narrowly defined constructs. In addition, the use of purposive sampling within Islamic boarding school settings may limit the broader generalizability of the findings across different educational and cultural contexts. Future research may therefore benefit from refining item specificity, examining alternative structural approaches such as higher-order or bifactor models, and conducting further validation studies in more diverse populations and educational environments.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

The author declares no financial, personal, or institutional conflict of interest in connection with the conduct and reporting of this research.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study. Participation was entirely voluntary, and respondents were informed about the purpose of the research, the confidentiality of their responses, and their right to withdraw at any time without consequence.

DATA AVAILABILITY

The data that support the findings of this study are available from the first author, [RA], upon reasonable request. The data are not publicly available to protect the confidentiality and privacy of research participants.

REFERENCES

- [1] F. H. Ruslana and S. Mulyono, "The relationship of cultural values with clean and healthy life behaviour among Islamic boarding school students in Indonesia," *Journal of Public Health Research*, vol. 11, no. 2, pp. 1–4, Apr. 2022, doi: 10.4081/jphr.2021.2739.
- [2] E. Nugraha and E. Syarifudin, "Improving health behavior standard through modern Islamic boarding school," *Jurnal Kesehatan Masyarakat*, vol. 16, no. 3, pp. 445–451, Mar. 2021, doi: 10.15294/kemas.v16i3.23112.
- [3] L. Lester and D. Mander, "A longitudinal mental health and wellbeing survey of students transitioning to a boys' only boarding school," *Australian and International Journal of Rural Education*, vol. 30, no. 2, pp. 67–83, Jul. 2020, doi: 10.47381/aijre.v30i2.261.
- [4] C. Mameli, R. Biolcati, S. Passini, and G. Mancini, "School context and subjective distress: the influence of teacher justice and school-specific well-being on adolescents' psychological health," *School Psychology International*, vol. 39, no. 5, pp. 526–542, Oct. 2018, doi: 10.1177/0143034318794226.
- [5] P. Jafari, F. Nozari, F. Ahrari, and Z. Bagheri, "Measurement invariance of the Depression Anxiety Stress Scales-21 across medical student genders," *International Journal of Medical Education*, vol. 8, pp. 116–122, Mar. 2017, doi: 10.5116/ijme.58ba.7d8b.
- [6] B. Lee and H. I. Jeong, "Construct validity of the perceived stress scale (PSS-10) in a sample of early childhood teacher candidates," *Psychiatry and Clinical Psychopharmacology*, vol. 29, no. 1, pp. 76–82, Jan. 2019, doi: 10.1080/24750573.2019.1565693.
- [7] E. A. Hutton, J. L. Skues, J. A. Sullivan, and L. Z. Wise, "Mental health research in the global construction industry: a scoping review using a dual-continuum model of mental health," *Mental Health & Prevention*, vol. 28, p. 200249, Dec. 2022, doi: 10.1016/j.mhp.2022.200249.
- [8] E. Magalhães, "Dual-factor models of mental health: a systematic review of empirical evidence," *Psychosocial Intervention*, vol. 33, no. 2, pp. 89–102, May 2024, doi: 10.5093/pi2024a6.
- [9] T. L. Renshaw, S. J. Bolognino, and K. N. Clark, "Exploring a dual-factor mental health screening model with children in grades 5–10," *School Psychology*, vol. 40, no. 4, pp. 516–523, Jul. 2025, doi: 10.1037/spq0000669.
- [10] Z. D. Maupin, "Using a dual-factor model to understand the mental health of students with school refusal behavior," Ph.D. dissertation, Chapman University, California, United States, 2021.
- [11] J. Xiong, Y. Qin, M. Gao, and M. Hai, "Longitudinal study of a dual-factor model of mental health in Chinese youth," *School Psychology International*, vol. 38, no. 3, pp. 287–303, Jun. 2017, doi: 10.1177/0143034317689970.
- [12] E. Fino, D. Mema, and V. Treska, "The interpersonal dimension of pandemic fear and the dual-factor model of mental health: the role of coping strategies," *Healthcare*, vol. 10, no. 2, p. 247, Jan. 2022, doi: 10.3390/healthcare10020247.
- [13] J. M. Stephens, M. Iasiello, K. Ali, J. van Agteren, and D. B. Fassnacht, "The importance of measuring mental wellbeing in the context of psychological distress: using a theoretical framework to test the dual-continua model of mental health," *Behavioral Sciences*, vol. 13, no. 5, p. 436, May 2023, doi: 10.3390/bs13050436.
- [14] C. L. M. Keyes, "The dual continua model: the foundation of the sociology of mental health and mental illness," in *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*, 3rd ed., T. L. Scheid and E. R. Wright, Eds., Cambridge, UK: Cambridge University Press, 2017, pp. 66–81, doi: 10.1017/9781316471289.007.
- [15] A. J. Thayer, M. R. Weeks, and C. R. Cook, "Dual factor mental health model: validation through mixture modeling and cut scores," *Psychology in the Schools*, vol. 58, no. 2, pp. 286–306, Feb. 2021, doi: 10.1002/pits.22447.
- [16] İ. Dadandı and F. Aydin, "Psychometric properties and the network analysis of the Turkish version of the multidimensional flourishing scale: associations with psychological distress," *Behavioral Sciences*, vol. 15, no. 6, p. 800, Jun. 2025, doi: 10.3390/bs15060800.
- [17] L. E. Aarø, M. Knapstad, and O. R. Smith, "Positive mental wellbeing or symptoms of depression? Discriminant validity of the Warwick-Edinburgh Mental Wellbeing Scale," *BMC Psychiatry*, vol. 25, no. 1, p. 487, May 2025, doi: 10.1186/s12888-025-06922-0.
- [18] M. Zaini, "Measuring new learners' adaptability and psychological health: using school wellbeing's intervening role at Islamic boarding schools," *Journal of Education and Religious Studies*, vol. 5, no. 2, pp. 48–59, Jun. 2025, doi: 10.57060/jers.kxy7w592.
- [19] A. Y. Pulihasih, D. Handayani, M. Ibad, A. Q. A. A. Isyrofi, and M. Zamzam, "An introspective survey of modern Islamic boarding school to increase health awareness of Islamic boarding schools in Surabaya," *Revista de Gestão Social e Ambiental*, vol. 18, no. 5, p. e05642, Mar. 2024, doi: 10.24857/rgsa.v18n5-096.
- [20] M. Yusuf, Alwis, M. Rasidin, D. Witro, and A. Nurjaman, "The role of Islamic boarding schools in student empowerment: study of Anak Jalanan At-Tamur Islamic Boarding School in Bandung Regency," *Kasetsart Journal of Social Sciences*, vol. 45, no. 3, pp. 779–790, 2024, doi: 10.34044/j.kjss.2024.45.3.09.
- [21] P. J. Lazarus, B. Doll, S. Y. Song, and K. Radliff, "Transforming school mental health services based on a culturally responsible dual-factor model," *School Psychology Review*, vol. 51, no. 6, pp. 755–770, Nov. 2022, doi: 10.1080/2372966X.2021.1968282.
- [22] B. Oppedal, S. Keles, C. Cheah, and E. Røysamb, "Culture competence and mental health across different immigrant and refugee groups," *BMC Public Health*, vol. 20, no. 1, p. 292, Dec. 2020, doi: 10.1186/s12889-020-8398-1.
- [23] X. Wang, D. Zhang, and J. Wang, "Dual-factor model of mental health: surpass the traditional mental health model," *Psychology*, vol. 2, no. 8, pp. 767–772, 2011, doi: 10.4236/psych.2011.28117.
- [24] S. M. Y. Arafat, H. R. Chowdhury, M. M. A. S. Qusar, and M. A. Hafez, "Cross cultural adaptation and psychometric validation of research instruments: a methodological review," *Journal of Behavioral Health*, vol. 5, no. 3, pp. 129–136, 2016, doi: 10.5455/jbh.20160615121755.
- [25] M. Yang *et al.*, "Safe and valid? A systematic review of the psychometric properties of culturally adapted depression scales for use among indigenous populations," *Cambridge Prisms: Global Mental Health*, vol. 10, p. e60, Sep. 2023, doi: 10.1017/gmh.2023.52.

- [26] A. Darwanto, R. C. I. Prahmana, A. Susanti, and I. A. Khalil, "Transformation of boarding school management models in enhancing student accessibility and educational quality," *Jurnal Pendidikan Agama Islam*, vol. 21, no. 1, pp. 145–164, Jun. 2024, doi: 10.14421/jpai.v21i1.8632.
- [27] M. Ratodi, T. Zubaidah, and L. Marlinae, "Mental health resilience among Santri: a salutogenic perspective on psychological well-being in Pesantren," *Jurnal Promkes*, vol. 13, no. SI2, pp. 101–107, Aug. 2025, doi: 10.20473/jpk.V13.ISI2.2025.101-107.
- [28] M. N. Ihsan, N. Ahmad, A. Hasanah, and A. Suhartini, "Islamic boarding school culture climate in forming the religious attitude of Islamic students in modern and agrobusiness Islamic boarding schools," *Nazhruna: Jurnal Pendidikan Islam*, vol. 4, no. 2, pp. 362–382, Jul. 2021, doi: 10.31538/nzh.v4i2.1492.
- [29] S. Chen, W. Wang, and Y. Li, "Preliminary development of a culturally adapted questionnaire on mental health literacy for Chinese junior high school students," *Psychology Research and Behavior Management*, vol. 18, pp. 1049–1060, Apr. 2025, doi: 10.2147/PRBM.S491534.
- [30] G. O. Boateng, T. B. Neilands, E. A. Frongillo, H. R. Melgar-Quiñonez, and S. L. Young, "Best practices for developing and validating scales for health, social, and behavioral research: a primer," *Frontiers in Public Health*, vol. 6, p. 149, Jun. 2018, doi: 10.3389/fpubh.2018.00149.

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