

Development of a Resilience Measurement Tool: Adaptation of the Resilience Scale for Adolescents

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Abstract

The increasing psychological challenges faced by Indonesian adolescents highlight the need for a culturally appropriate and psychometrically robust measure of resilience. This study aimed to adapt and validate the Rugged Resilience Measure (RRM) for adolescents within the Indonesian cultural and linguistic context. The adaptation procedure followed standardized guidelines, including forward translation, back translation, synthesis, and expert equivalence review. Data were collected from 1.091 adolescents aged 12–15 years, and Confirmatory Factor Analysis (CFA) was conducted to examine the construct validity of the adapted scale. Results showed that all items demonstrated satisfactory factor loadings (0.700–0.808), and the unidimensional instrument demonstrated good fit (CFI = 0.952; TLI = 0.938; RMSEA = 0.088; SRMR = 0.032). The instrument also showed strong internal consistency ($\alpha = 0.920$). These findings support the validity and reliability of the Indonesian version of the RRM and provide an evidence-based tool for understanding adolescent resilience amid rapid digitalization and developmental challenges. The adapted measure offers practical value to researchers, educational institutions, and policymakers in designing programs and interventions to strengthen adolescent mental health.

Keywords: instrument adaptation, resilience, adolescents, RRM

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INTRODUCTION

Serious mental health problems are currently plaguing Indonesian adolescents and have shown a worrying upward trend in the past three years. According to UNICEF's 2024 adolescent health report, suicide remains one of the leading causes of death among adolescents, while mental health symptoms and various injury-related risks, especially those involving violence, continue to be prevalent (UNICEF, 2025). Similarly, findings from the Indonesia National Adolescent Mental Health Survey (I-NAMHS) revealed that one in three adolescents aged 10–17 years, approximately 15.5 million adolescents, experience mental health problems (Universitas Gadjah Mada, 2022). These patterns reflect the heightened psychological vulnerability of adolescents, who are navigating a transitional developmental stage marked by rapid physical, cognitive, and socio-emotional changes (Santrock, 2019). During this period, adolescents often experience intense emotional fluctuations and identity exploration, which may contribute to psychological instability. When left unmanaged, this vulnerability can manifest in various forms of maladaptive behaviour. Data from the National Criminal Information Center (Pusiknas Polri) indicate that hundreds of adolescents were involved in criminal acts in the first half of 2025, including theft (437 cases), assault or mob violence (460 cases), and drug-related offenses (349 cases) (Pusiknas Polri, 2025).

Given these challenges, cultivating psychological resilience is essential for adolescents to maintain healthy psychological functioning and to buffer against emotional distress and risk-taking behaviours. Although resilience and coping are closely related, resilience reflects enduring personal qualities expressed through observable behaviours, while coping often neglects social context, an element central to resilience. Resilience supports individuals in dealing with stress or adversity, reduces vulnerability to environmental risks, and helps maintain stable self-esteem under pressure (Rutter, 2012).

It encompasses internal strengths, social resources, and family cohesion that help individuals preserve mental health (Ungar, 2012). Empirical studies have shown that resilience contributes to improved adolescent mental health outcomes, including higher self-esteem, reduced anxiety, diminished depressive symptoms, and lower obsessive-compulsive tendencies (Joyce et al., 2020). Moreover, adolescents with low resilience tend to show greater distress, poorer quality of life, and lower self-control (Marta et al., 2023). They are also more likely to engage in substance use, such as alcohol and tobacco (Kennedy et al., 2019). Findings by Jerry et al. (2023) further demonstrate that higher levels of resilience are associated with lower levels of depression among adolescents. A meta-analysis by Pinto et al. (2021) confirms that resilience-focused interventions are particularly effective for adolescents because this life stage represents a critical window for adaptive skill development. Taken together, resilience is an essential protective factor that helps adolescents navigate developmental challenges and prevents the emergence of behavioural and adjustment problems.

Resilience is an observable behavioural outcome of successful adaptation to adversity and arises from the interaction between ecological factors (family, school, community, culture) and individual attributes. Ungar (2012) emphasizes that resilience also involves “steeling effects,” where individuals become strengthened through exposure to manageable adversity. The literature consistently describes resilience as a personal trait that enables growth in the face of challenges and serves as an adaptive coping mechanism for loss, pain, and hardship (Connor & Davidson, 2003; Singh & Yu, 2010; Jefferies et



al., 2022). Even in difficult circumstances, resilient individuals can adjust, sustain hope, and cultivate gratitude (Windle, 2010; Dimitriou et al., 2020). Despite the well-established importance of resilience, the Indonesian context lacks measurement tools that are culturally appropriate, psychometrically strong, and specifically tailored for adolescents. For example, although the Indonesian Resilience Evaluation Scale has been validated in undergraduate samples, no equivalent full-scale validation has been conducted for younger adolescent populations (Primasari et al., 2022). Recent work highlights that measurement tools in Indonesia often remain adapted from adult scales or focus on academic resilience (Reformasianto, 2024). Rofiqah et al. (2023) examined resilience among Indonesian adolescents; their study reported only preliminary factorial validity using a limited, non-representative sample and did not include full cultural adaptation or confirmatory factor analysis. These methodological gaps limit accurate assessment and consequently hinder the development of targeted interventions.

The Rugged Resilience Measure (RRM) offers a more contemporary and theoretically grounded framework by focusing on “rugged qualities,” such as adaptability, persistence, emotional regulation, and cognitive flexibility, traits that reflect internal strength rather than external recovery processes. However, RRM has never been adapted, culturally contextualized, or validated in Indonesia. Without such adaptation, its use for Indonesian adolescents is potentially inaccurate and conceptually misaligned. Therefore, to address the rising mental health challenges among adolescents and the lack of a validated resilience instrument suited to their developmental and cultural context, this study aims to adapt and modify the RRM for Indonesian adolescents. A valid and reliable measurement tool is urgently needed to support parents, schools, practitioners, and policymakers in designing effective programs and interventions to strengthen adolescent resilience.

METHOD

The adaptation procedure for the Rugged Resilience Measure (RRM) followed the stages proposed by Beaton et al. (2000). Prior to initiating the process, the researcher contacted Jefferies, the original author of the RRM, and obtained formal permission to adapt the instrument into Indonesian. The English version of the scale was translated into Indonesian using a forward-translation procedure by two independent bilingual translators familiar with psychological terminology. Subsequently, a different set of bilingual experts conducted a back translation of the Indonesian version into English. The original and back-translated versions were compared to identify discrepancies in meaning, and adjustments were made to ensure semantic and conceptual equivalence. Different linguistic experts performed each translation step to maintain objectivity. Three experts in psychology and measurement then evaluated the translated version to assess semantic, idiomatic, experiential, and conceptual equivalence. Based on the expert review, the item-level Content Validity Index (CVI) ranged from 0.85 to 1.00, and the overall CVI value was 1.00, indicating excellent content validity (Beaton et al., 2000).

Participants were 1,091 adolescents aged 12 to 15 years residing in Surabaya, Indonesia. The sampling technique used was convenience sampling, as participants were recruited from two schools that were accessible to the researchers during the data collection period (Etikan, et al., 2016). This approach was chosen due to the practical constraints of school-based research and the requirement for institutional permission



before data collection. The sample size exceeded the recommended ratio of 5–10 participants per item for ensuring adequate statistical power and stability for both the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) procedures (Hair et al., 2019). The Indonesian version of the Rugged Resilience Measure consisted of 10 items rated on a five-point Likert scale (1 = Not at all to 5 = A lot). Higher scores indicated greater levels of rugged resilience. The data collection process was conducted in several formal stages. First, ethical clearance was obtained from the Research Ethics Committee of Universitas Ciputra Surabaya (No. 109/EC/KEPK-FKUC/IV/2024). The research team then applied for and received authorization from the Surabaya City Education Government to conduct the study in selected schools. After approval, the researchers contacted school principals and guidance teachers to explain the study objectives and obtain institutional consent. Teacher consent and participant assent were secured before participation, particularly for students under 18 years old. The survey was administered online using Google Forms, and participants were informed about anonymity, confidentiality, and their right to withdraw at any time without penalty.

The scale's internal structure was evaluated using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to examine its construct validity. The Rugged Resilience Measure (RRM), a self-report instrument originally developed by Jefferies et al. (2022) for individuals aged 16-29 across seven countries (Brazil, China, Indonesia, Russia, Thailand, the United States, and Vietnam), served as the basis for this study. Their validation study identified a single-factor structure with adequate model fit ($\chi^2 p < 0.001$, Comparative Fit Index [CFI] = 0.95, Root Mean Square Error of Approximation [RMSEA] = 0.08). In the present research, EFA was conducted to explore the underlying factor structure of the Indonesian version. Items with factor loadings above 0.30 were considered acceptable for retention, following the guidelines of Hair et al. (2019). Sampling adequacy was verified using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity. Factor extraction was based on eigenvalues greater than 1 (Kaiser criterion) and the scree-plot test. Subsequently, CFA was performed to confirm the single-factor model using multiple fit indices, including χ^2/df , CFI, Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Acceptable model fit was defined as CFI and TLI ≥ 0.90 , RMSEA ≤ 0.08 , and SRMR ≤ 0.08 (Brown, 2015). Data were analyzed using JASP version 0.18.1.

RESULTS AND DISCUSSION

Results

According to Table 1's demographic data, the respondents' ages ranged from 12 to 15 years, with 35.75% of them being 14. The majority of responders (84.97%) hailed from households where both parents were present. With 47.39% of respondents being men and 52.61% being women, the sample's gender distribution was comparatively balanced.

Prior to assessing the model, the data were first examined using Exploratory Factor Analysis (EFA) to see how the scale's items clustered. The RRM is unidimensional, as its items clustered into a single factor based on the EFA results (Table 2). This result is in line with the Jefferies et al. (2022) original version of the RRM. To



evaluate the measurement instrument's model fit, a Confirmatory Factor Analysis (CFA) using a single-factor model was conducted following the EFA results.

Teenage respondents' factor loadings on the ten-item Indonesian version of the RRM ranged from 0.700 to 0.808 (Table 3). The link between the latent variable and the observed indicators is represented by factor loadings (Wang & Wang, 2020). Ford et al. (1986) proposed a lower limit of 0.4, and Brown (2015) indicated that the minimum acceptable threshold for factor loadings is 0.3. The items in the Indonesian version of the RRM, which was created for adolescents, appropriately reflect the anticipated elements of resilience measurement based on these standards.

Table 1.

Demographic Data

Demographic Data	Category	Frequency (N)	Percentage (%)
Gender	Male	517	47.39
	Female	574	52.61
	Total	1091	100
Age	12 years old	121	11.09
	13 years old	359	32.90
	14 years old	390	35.75
	15 years old	221	20.26
	Total	1091	100
Grade Level	7th Grade	353	32.36
	8th Grade	374	34.28
	9th Grade	364	33.36
	Total	1091	100
Parents' Marital Status	Married	927	84.97
	Divorced (living separately)	52	4.77
	Divorced and Remarried	45	4.12
	Widowed	47	4.31
	Widowed and Remarried	20	1.83
	Total	1091	100



Table 2.
Explanatory Factor Analysis

Item	Factor 1
1	0.670
2	0.747
3	0.772
4	0.778
5	0.785
6	0.744
7	0.606
8	0.711
9	0.765
10	0.758

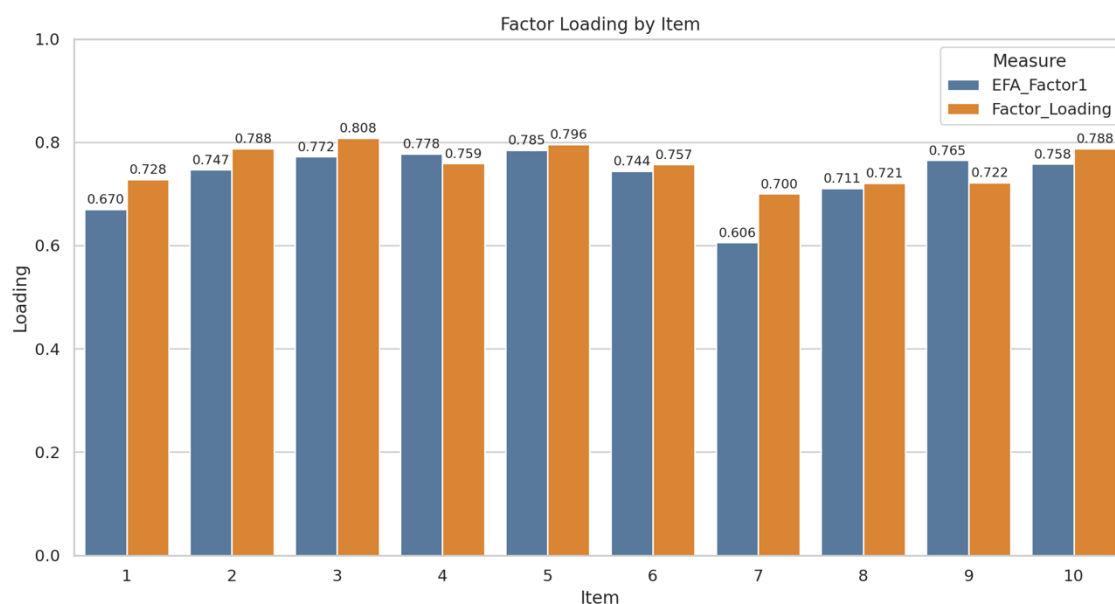
Table 3.
Factor Loading

Item	Factor Loading
1	0.728
2	0.788
3	0.808
4	0.759
5	0.796
6	0.757
7	0.700
8	0.721
9	0.722
10	0.788

The Comparative Fit Index (CFI), with a minimum acceptable value of 0.90 indicating a satisfactory fit, was one of the criteria used in this investigation to assess model fit. Moreover, the incremental fit indices included the Tucker-Lewis Index (TLI), which is anticipated to surpass 0.90 (Wang & Wang, 2020). Additionally, this study evaluated two absolute fit indices: the Root Mean Square Error of Approximation (RMSEA) with a cutoff value of <0.08 and the Standardized Root Mean Square Residual (SRMR) with a cutoff value of <0.08 (Brown, 2015; Wang & Wang, 2020; Kline, 2023). When there is no discernible difference between the model and the data, the chi-square value should ideally exceed 0.05 (Jöreskog & Sörbom, 1993). Nevertheless, the chi-square statistic is quite sensitive to sample size; the chi-square result tends to become statistically significant as the sample size grows. Because of this constraint, although the chi-square result in this investigation was significant ($p < 0.001$; Table 4), it was not the primary basis for assessing model fit. The fit indices for this investigation were CFI = 0.952, TLI = 0.938, RMSEA = 0.088, and SRMR = 0.032. These findings showed that the RRM's Indonesian adaptation provided a satisfactory model fit. Cronbach's α was used to measure reliability, yielding 0.920. Additionally, the item-rest correlation values showed high internal consistency, ranging from 0.580 to 0.747.



Graph 1.
Bar Graphs Group the Explanatory Factor Analysis and Factor Loading Values
on Each Item



The validity of the Rugged Resilience Measure (RRM), adapted for Indonesian adolescents, was investigated in this study. The Indonesian version of the RRM, which consists of 10 items standardized for adolescents, was determined to exhibit a sufficient internal structure in accordance with model fit requirements during the adaptation process. The factor loading range for the Indonesian adolescent version of the RRM was 0.700-0.808. Overall, the items had satisfactory factor loadings. This shows that every item successfully captures the specified resilience construct.

Discussion

Additionally, the Indonesian version of the resilience scale demonstrated an acceptable model fit across numerous fit indices. As a result, the scale can be used once it has been contextually and linguistically modified for Indonesian adolescents. The importance of creating the Indonesian translation stems from resilience's vital role in helping adolescents overcome daily obstacles. Strengthening adolescents' resilience is crucial amid rapid technological advancement and digitalization because it helps them cope with the dangers of misinformation, cyberbullying, device and social media addiction, and social pressures arising from digital interactions (Santos et al., 2021; Lee & Hancock, 2023).

The creation of the RRM for Indonesian adolescents can be a useful instrument for evaluating how resilient adolescents are in overcoming different obstacles in their life. Relevant entities, such as government agencies and educational institutions, can then utilize this information as a reference when making decisions (Tasijawa & Siagian, 2022; D'Angelo, 2022). The idea of resilience has been criticized for sometimes being conflated with invulnerability, which suggests that resilience is primarily concerned with how people successfully adapt while overlooking the role of environmental factors that



facilitate positive change (Mahdiani & Ungar, 2021). However, Jefferies et al. (2022) stressed that relying solely on external resources is not as crucial for promoting positive outcomes in the face of adversity as is utilizing and developing an individual's internal attributes.

Resilience, on the other hand, has a dynamic impact, meaning a person may exhibit resilience in some situations but not always. Thus, in the upcoming years, the creation of this measurement instrument may improve longitudinal research (Rutter, 2012; Yoon et al., 2024). According to this study, the Indonesian adaptation of the resilience scale demonstrated excellent internal validity and can be used successfully in other studies. Nonetheless, this scale can be strengthened in several ways. To increase the scale's applicability and enable its use in a variety of study scenarios in the future, its validity should be further evaluated across diverse demographics.

CONCLUSION

This study aimed to adapt and validate the Rugged Resilience Measure (RRM) for Indonesian adolescents, providing a psychometrically sound and culturally appropriate tool to assess resilience in this population. The novelty of this study lies in introducing the first validated measure of rugged resilience specifically designed for Indonesian adolescents, addressing the absence of culturally adapted resilience assessments for this age group. The Indonesian RRM can serve as a valuable tool for school psychologists and counselors to identify students with low resilience; for educators and policymakers to design programs that strengthen students' coping skills; and for researchers to evaluate the effectiveness of mental health interventions. Despite its promising findings, this study is limited by the use of a convenience sample drawn from schools in Surabaya, which may not fully represent all Indonesian adolescents, and by the absence of external validity testing, such as correlations with other resilience measures. Therefore, generalizations should be made with caution. Future studies are recommended to investigate the predictive validity of the RRM, explore its longitudinal stability, and adapt it for adolescents in other cultural and regional settings across Indonesia. Overall, this study provides an important foundation for resilience research and contributes a culturally relevant measurement tool to support adolescent mental health initiatives in Indonesia.

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Appendix 1.

Indonesian Version of Rugged Resilience Measure

1. Saya percaya pada diri saya sendiri.
 tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
2. Saya mampu menyesuaikan diri dengan situasi-situasi yang menantang.
 tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
3. Saya dapat menemukan solusi untuk masalah-masalah yang saya hadapi.
 tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
4. Saya mampu bertahan dan terus maju meskipun mengalami kesulitan.
 tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu



5. Saya dapat mengatur diri saya dengan baik ketika orang-orang memerlukan waktu atau perhatian saya di saat yang bersamaan.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
6. Bahkan ketika saya mengalami hambatan, saya tetap optimis dengan masa depan saya.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
7. Saya biasanya dapat mengendalikan emosi saya.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
8. Saya bangga dengan hal-hal yang telah saya capai.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
9. Ketika dihadapkan dengan kesulitan, saya dapat bangkit menghadapi tantangan tersebut.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu
10. Saya dapat menemukan makna dalam hidup saya.
- tidak pernah
 hampir tidak pernah
 kadang-kadang
 sering
 selalu

