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Construct Validity and Internal Consistency of the Indonesian 25-Item CD-RISC in Adults with Chronic Disease: A Confirmatory Factor Analysis

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Abstract

Background: Psychometric evidence for the Connor-Davidson Resilience Scale (CD-RISC) in heterogeneous chronic disease populations remains limited. **Objective:** This study assessed the construct validity and internal consistency of the 25-item CD-RISC among Indonesian adults with chronic diseases. **Method:** The sample comprised 254 adults aged 18–40 with a professional chronic disease diagnosis, recruited purposively. Confirmatory factor analysis (CFA) tested the five-factor model. Convergent validity and internal consistency were examined using AVE, CR, Cronbach's alpha, and McDonald's omega. **Results:** Model fit was χ^2 = 753, df = 265, p < .001, RMSEA = .085, CFI = .867, TLI = .850, and SRMR = .052. Only SRMR met the recommended cut-off. Factor loadings ranged from .527 to .811. CR was acceptable for four factors (.762–.884) but not for Factor 5 (.575), and AVE was below .50 for Factors 1, 2, and 5 (.404–.489). Total-scale internal consistency was high (α = .952; ω = .953). **Conclusion:** The total CD-RISC scale showed high internal consistency and all items had adequate factor loadings, but the five-factor model showed suboptimal fit and some factors had inadequate convergent validity. The factor structure requires further refinement, and measurement invariance testing across relevant subgroups remains necessary in future studies.

Keywords: Resilience; Chronic Disease; Construct Validity; Psychometric Evaluation; Connor-Davidson Resilience Scale

Abstrak

Latar Belakang: Bukti psikometrik mengenai Skala Resiliensi Connor-Davidson (CD-RISC) pada kelompok populasi yang menderita penyakit kronis secara umum masih terbatas. **Tujuan:** Penelitian ini mengevaluasi validitas konstruk dan konsistensi internal CD-RISC yang terdiri dari 25 item pada orang dewasa Indonesia yang menderita penyakit kronis. **Metode:** Sampel terdiri dari 254 orang dewasa berusia 18–40 tahun dengan diagnosis penyakit kronis yang telah dikonfirmasi secara profesional, yang direkrut secara purposif. Analisis faktor konfirmatori (CFA) digunakan untuk menguji model lima faktor. Validitas konvergen dan konsistensi internal dievaluasi menggunakan AVE, CR, koefisien alfa Cronbach, dan omega McDonald. **Hasil:** Kesesuaian model adalah χ^2 = 753, df = 265, p < 0,001, RMSEA = 0,085, CFI = 0,867, TLI = 0,850, dan SRMR = 0,052. Hanya SRMR yang memenuhi batas nilai yang direkomendasikan. Beban faktor berkisar antara 0,527 hingga 0,811. CR dapat diterima pada empat faktor (0,762–0,884) tetapi tidak pada Faktor 5 (0,575), sedangkan AVE berada di bawah 0,50 pada Faktor 1, 2, dan 5 (0,404–0,489). Konsistensi internal skala total tinggi (α = 0,952; ω = 0,953). **Simpulan:** Skala CD-RISC total menunjukkan konsistensi internal yang tinggi dan seluruh butir memiliki beban faktor yang memadai, tetapi model lima faktor menunjukkan kesesuaian yang belum optimal dan beberapa faktor memiliki validitas konvergen yang belum memadai. Struktur faktor perlu disempurnakan lebih lanjut, dan pengujian invarian pengukuran pada subkelompok yang relevan tetap diperlukan dalam penelitian selanjutnya.

Kata Kunci: Resiliensi; Penyakit Kronis; Validitas Konstruk; Evaluasi Psikometrik; Connor-Davidson Resilience Scale

Introduction

Chronic diseases, also referred to as noncommunicable diseases (NCDs), have become a major global health challenge (World Health Organization, 2025). NCDs caused at least 43 million deaths in 2021, equivalent to approximately 75% of all non-pandemic-related deaths worldwide (World Health Organization, 2025). Cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes are the four major groups of NCDs that account for approximately 80% of all premature deaths due to NCDs (World Health Organization, 2019; 2025). Beyond mortality, NCDs constitute a substantial burden of disability and are increasingly associated with multimorbidity. More than one-third of people aged 16 years and older across OECD countries reported a longstanding illness or health problem in 2021 (OECD, 2025), and the Global Burden of Disease Study 2021 estimated 7.3 billion prevalent NCD cases and 1.73 billion disability-adjusted life years (DALYs) globally (GBD 2021 Disease and Injuries Collaborators, 2024).

A similar burden is observed in Indonesia, where NCDs accounted for 52.2% of all deaths in 2021, representing the largest broad category of causes of death (World Health Organization, 2025). The probability of dying between the ages of 30 and 70 years from these four disease groups in Indonesia was estimated at 24.0% in 2019 (World Health Organization, 2024). Multimorbidity also increases from 15.6% among those aged 40–59 years to 24.9% among those aged 60 years and older (Griselda et al., 2023). These findings underscore the need for sustained long-term disease management in Indonesia.

Chronic diseases are long-term health conditions that often require continuous management and can affect individuals' physical, psychological, and social functioning (Rina et al, 2024; World Health Organization, 2025; CDC, 2026). Multimorbidity and complex treatment demands create a substantial treatment burden, which is associated with treatment non-adherence, disease progression, poorer health status, and lower quality of life (Mendoza-Quispe et al., 2023; Lee et al., 2024). Psychosocial factors such as chronic stress and low social support also contribute to the development and outcomes of chronic diseases (World Health Organization, 2021). These conditions place individuals with chronic diseases at risk of a reduced quality of life, making psychological well-being an important component of adaptation to illness (Akif et al., 2024; Riecke et al., 2024). Resilience is considered a psychological resource that enables individuals to adapt positively to the various pressures associated with chronic disease by maintaining hope, regulating emotions, and using adaptive coping strategies (Novak et al., 2023; Traeger et al., 2022). Recent systematic reviews and meta-analyses indicate that resilience-enhancing interventions significantly improve psychological well-being and adaptive capacity among individuals with chronic diseases (Janitra et al., 2024; Zulkifli et al., 2024). Valid measurement of resilience in this population is therefore essential for both research and clinical practice.

Given the importance of resilience in helping individuals adapt to the challenges of chronic disease, various instruments have been developed to measure this construct, one of the most widely used being the Connor-Davidson Resilience Scale (CD-RISC). Connor and Davidson (2003) defined resilience as a personal quality that enables individuals to endure, adapt, and bounce back when facing stress, adversity, or traumatic experiences. The CD-RISC was developed as a 25-item self-report instrument using a five-point Likert scale to measure individual resilience and has been evaluated across various populations. The original development study identified five dimensions: personal competence, high standards, and tenacity; trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; positive acceptance of change and secure relationships; control; and spiritual influences (Connor & Davidson, 2003). A reliability-generalization meta-analysis likewise reported high overall internal consistency for CD-RISC 25 across 27 studies, further supporting its reliability across diverse populations and settings (Wojujutari et al., 2024).

Various studies have evaluated the psychometric characteristics of the Connor-Davidson Resilience Scale (CD-RISC) across diverse populations and cultural contexts and have generally reported acceptable validity and reliability, although its factor structure has not always been replicated. In the context of chronic disease, Lubián-López et al. (2021) tested the 25-item and 10-item versions of the CD-RISC among 202 women with endometriosis in Spain and found that both versions demonstrated excellent model fit (RMSEA = 0.001; CFI = 1.000; SRMR = 0.012) and high internal reliability (α = 0.890). In Indonesia, Ningsih et al. (2023) validated the CD-RISC among 184 patients with diabetes mellitus and obtained adequate goodness-of-fit indices (RMSEA = 0.080; GFI = 0.930; AGFI = 0.910), with factor loadings ranging from 0.384 to 0.644 and reliability of α = 0.890. Among 137 people with disabilities in Indonesia, Hanjarwati et al. (2022) reported high reliability (α = 0.931). Meanwhile, a study by Fu et al. (2014) in a disaster context involving 2,132 earthquake survivors in Sichuan, China, showed that the resilience structure had good reliability (α = 0.860) and identified dimensions such as rational thinking and self-awareness as prominent aspects in the local cultural context. Similar findings were reported by Karaırmak (2010) among 246 earthquake survivors in

Turkey, where confirmatory factor analysis showed good model fit (RMSEA = 0.065; SRMR = 0.052; CFI = 0.920), with most items having factor loadings above 0.30 and very high reliability (α = 0.920), although one item was eliminated because it did not meet the psychometric criteria. Furthermore, Reformasianto et al. (2024) adapted the CD-RISC among 369 Indonesian adults and obtained adequate model indices (RMSEA = 0.050; SRMR = 0.040; CFI = 0.910; TLI = 0.900), indicating that instrument modification was required to accommodate Indonesian cultural characteristics.

Although previous studies have provided evidence of the psychometric properties of the CD-RISC across various populations, evidence from heterogeneous chronic disease populations remains limited. Evidence from chronic disease samples comes mainly from single-diagnosis groups, such as women with endometriosis (Lubián-López et al., 2021) and patients with diabetes (Ningsih et al., 2023), while other Indonesian evidence comes from samples not defined by chronic disease (Hanjarwati et al., 2022; Reformasianto et al., 2024). It therefore remains unclear whether the five-factor structure of the CD-RISC holds in a heterogeneous group of individuals who differ in diagnosis, disease trajectory, and psychosocial challenges. Because participant characteristics and cultural context can influence an instrument's construct structure, this question needs to be tested empirically rather than assumed. The originality of this study lies in testing the five-factor structure of the 25-item CD-RISC with confirmatory factor analysis (CFA) in a single sample of Indonesian adults with various chronic diseases, and in evaluating model fit together with convergent validity (AVE and CR) and internal consistency (Cronbach's alpha and McDonald's omega). Accordingly, this study aimed to evaluate the construct validity and internal consistency of the Connor-Davidson Resilience Scale (CD-RISC) among Indonesian adults with chronic diseases.

Method

Sample or Population

This study received ethical approval from Universitas Airlangga under approval number 762/B/UN3.FPSI/III/TA.00.03/2025. Data were collected from several communities of individuals with chronic diseases in Indonesia. Participants were adults aged 18–40 years who had been diagnosed with a chronic disease by a healthcare professional. (Chen et al., 2013; Sassi et al., 2016). A total of 254 respondents who had been diagnosed with a chronic disease by a professional healthcare provider and completed the research instrument in full were included in the analysis.

Data Measurement

The instrument used in this study was the Connor-Davidson Resilience Scale (CD-RISC) developed by Connor and Davidson (2003), which measures resilience as an individual's ability to recover from adversity and maintain psychological and physical well-being while adapting positively to challenging life circumstances. The CD-RISC comprises 25 items representing five dimensions of resilience, namely personal competence, high standards, and tenacity; trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; positive acceptance of change and secure relationships; control; and spiritual influences. Responses were rated using a 5-point Likert scale, ranging from 0 (not true at all) to 4 (true nearly all the time), with higher scores indicating greater resilience. The Indonesian version of the CD-RISC was administered to all participants, and the complete blueprint of the instrument, including the distribution of items across each dimension, is presented in Table 1. The source of this Indonesian version and its adaptation are described in the Procedure section.

Table 1. Aspects and Blueprint of the 25-items CD-RISC

Factors	Description	Item Numbers
Personal competence, high standards, and tenacity	The ability to maintain one's competence, set high standards, and remain persistent in the face of challenges.	24, 12, 11, 25, 10, 23, 17, 16
Trust in one's instincts, tolerance of negative affect, and strengthening effects of stress.	The ability to trust one's intuition, manage negative emotions, and adapt positively to stress.	20, 18, 15, 6, 7, 19, 14
The positive acceptance of change, and secure relationships.	The ability to embrace change positively and build safe and supportive interpersonal relationships.	1, 4, 5, 2, 8
Control	An individual's belief in their ability to control their behavior and handle situations effectively.	22, 13, 21

Spiritual influences	The use of spiritual values as a source of meaning, hope, and strength in the face of adversity.	3, 9

Procedure

This study evaluated the psychometric characteristics of the Connor-Davidson Resilience Scale (CD-RISC) among individuals with chronic diseases through several systematic stages. The first stage was a literature review of the conceptual foundations of resilience and the psychometric characteristics of the CD-RISC across various populations. The second stage was the adaptation of the scale into Indonesian, guided by the cross-cultural adaptation guidelines of Beaton et al. (2000) and the International Test Commission (2017), which aim to achieve semantic, idiomatic, experiential, and conceptual equivalence between the original and the adapted version rather than literal word-for-word translation. Written permission to use and modify the scale was first obtained from its authors in October 2024. The items were then translated forward from English into Indonesian by two qualified translators. The translation was subsequently refined through linguistic modification, based on expert judgment, to ensure that the wording was clear, culturally relevant, and easily understood by adults with chronic diseases, while the item content and the 0–4 response format were kept unchanged. The adapted version was then piloted as an online questionnaire, together with the study information sheet and informed consent form, among adults with chronic diseases from February to May 2025. The data from this pilot administration served as the basis for the validity and internal consistency analyses reported in this study. This study received ethical approval from Universitas Airlangga under approval number 762/B/UN3.FPSI/III/TA.00.03/2025 before data collection was conducted.

During the data collection stage, the questionnaire was distributed to several communities of individuals with chronic diseases in Indonesia using purposive sampling in accordance with the study's inclusion criteria. Participation was voluntary, and all respondents provided consent before completing the questionnaire. All responses were subsequently reviewed to ensure data completeness before analysis.

The final stage consisted of a psychometric evaluation of the instrument, focusing on validity evidence based on internal structure. Confirmatory Factor Analysis (CFA) was conducted to test the fit of the CD-RISC measurement model to the theoretical structure proposed by Connor and Davidson (2003). Convergent validity was then evaluated using Average Variance Extracted (AVE) and Composite Reliability (CR), while the instrument's internal consistency was evaluated using Cronbach's alpha and McDonald's omega coefficients.

Data Analysis

The initial analysis used descriptive statistics to describe respondents' demographic characteristics, including frequencies, percentages, means, and standard deviations. The construct validity of the Connor-Davidson Resilience Scale (CD-RISC) was then evaluated using Confirmatory Factor Analysis (CFA) to test the fit of the measurement model based on the five-factor structure proposed by Connor and Davidson (2003). Model fit was evaluated using several goodness-of-fit indices: chi-square (χ^2; $p > 0.05$), Root Mean Square Error of Approximation (RMSEA ≤ 0.08), Standardized Root Mean Square Residual (SRMR ≤ 0.08), Comparative Fit Index (CFI ≥ 0.90), and Tucker-Lewis Index (TLI ≥ 0.90), following the recommendations of Hu and Bentler (1999), MacCallum et al. (1996), and Kline (2013). The validity of each indicator was also evaluated based on its standardized factor loading, with values ≥ 0.40 considered to meet the indicator validity criterion (Hair et al., 2020).

Convergent validity was evaluated using Average Variance Extracted (AVE ≥ 0.50) and Composite Reliability (CR ≥ 0.70) (Hair et al., 2020); factors with AVE < 0.50 were interpreted as having limited convergent validity, and those that also had CR < 0.70 as not meeting the criterion. Internal consistency of the total scale was assessed using Cronbach's alpha and McDonald's omega total (ω), with values ≥ 0.70 indicating adequate reliability (Hair et al., 2020). All analyses were conducted in jamovi.

Result

Following data cleaning, which excluded two respondents identified as outliers, 254 respondents diagnosed with chronic diseases were included in the analysis. Most respondents were aged 30–40 years (73.6%), while the remainder were aged 18–29 years (26.4%). By gender, most respondents were women (83.1%), while men accounted for 16.9%. By disease type, other chronic diseases were the most frequently reported diagnoses (47.6%), followed by other autoimmune diseases (16.1%), scleroderma (15.4%), rheumatoid arthritis (10.2%), lupus (3.5%), diabetes (2.8%), hypertension (2.4%), cancer (1.6%), and heart disease (0.4%). Respondent characteristics are presented in Table 2.

Table 2. Respondent Characteristics (N = 254)

Characteristics	n	%
Age		
18–29 years	67	26.4
30–40 years	187	73.6
Gender		
Woman	211	83.1
Man	43	16.9
Diseases Types		
Scleroderma	39	15.4
Diabetes	7	2.8
Hypertension	6	2.4
Heart	1	0.4
Cancer	4	1.6
Lupus	9	3.5
Rheumatoid arthritis	26	10.2
Others autoimmune diseases	41	16.1
Others chronic diseases	121	47.6
Total	254	100

In addition to respondent characteristics, descriptive analyses were conducted for all items of the Connor-Davidson Resilience Scale (CD-RISC). The mean score for each item ranged from 2.35 to 3.45, with standard deviations ranging from 0.74 to 1.14. Item CD10 had the highest mean score (M = 3.45; SD = 0.74), whereas item CD20 had the lowest mean score (M = 2.35; SD = 1.10). Overall, all items showed adequate response variability and were therefore suitable for further analysis using Confirmatory Factor Analysis (CFA).

The construct validity of the Connor-Davidson Resilience Scale (CD-RISC) was evaluated using Confirmatory Factor Analysis (CFA) based on the theoretical five-factor model developed by Connor and Davidson (2003). The results showed that the model yielded $\chi^2 = 753$, df = 265, $p < 0.001$, RMSEA = 0.085, CFI = 0.867, TLI = 0.850, and SRMR = 0.052.

Based on the goodness-of-fit criteria, only the SRMR index met the cut-off value (< 0.08), whereas the RMSEA, CFI, and TLI values did not meet the recommended thresholds. These findings indicate that the five-factor model did not achieve adequate fit to the empirical data. Construct validity evidence based on the internal structure is therefore only partial, and it is interpreted below together with factor loadings, convergent validity, and composite reliability.

Table 3. Goodness of Fit Model CD-RISC

Index	Result	Cut-off	Description
χ^2	753	$p > 0.05$	Does not meet the requirements
df	265	-	-
RMSEA	0.085	<0.08	Does not meet the requirements
CFI	0.867	>0.90	Does not meet the requirements
TLI	0.850	>0.90	Does not meet the requirements
SRMR	0.052	<0.08	Meet the requirements

Although the model did not demonstrate optimal fit, all indicators had standardized factor loadings above the minimum threshold recommended by Hair et al. (2020), ranging from 0.527 to 0.811. This indicates that each item was meaningfully related to its intended dimension. However, adequate loadings do not offset the inadequate global model fit; all items were retained for the present analysis, but the misfit indicates that the factor structure requires refinement in future research.

Table 4. Result of Loading Factor

Factor	Item	Loading Factor
Factor 1	CDR10	0.770
	CDR11	0.700

	CDR12	0.603
	CDR16	0.804
	CDR17	0.784
	CDR23	0.671
	CDR24	0.660
	CDR25	0.604
Factor 2	CDR6	0.667
	CDR7	0.686
	CDR14	0.722
	CDR15	0.698
	CDR18	0.694
	CDR19	0.780
	CDR20	0.811
Factor 3	CDR1	0.778
	CDR2	0.684
	CDR4	0.527
	CDR5	0.766
	CDR8	0.530
Factor 4	CDR13	0.723
	CDR21	0.739
	CDR22	0.675
Factor 5	CDR9	0.693
	CDR3	0.650

Convergent validity was evaluated using Composite Reliability (CR) and Average Variance Extracted (AVE) for each factor. The results showed that all factors had CR values above the minimum threshold of 0.70, except Factor 5 (CR = 0.575). Meanwhile, AVE met the criterion of ≥ 0.50 for Factor 3 (0.542) and Factor 4 (0.517), whereas Factor 1 (0.489), Factor 2 (0.471), and Factor 5 (0.404) fell below the recommended value. Although a construct may still be retained when its CR is adequate even if its AVE is below 0.50 (Hair et al., 2020), this provides only marginal support for the convergent validity of Factors 1 and 2 (CR = 0.884 and 0.859). Factor 5 met neither criterion (CR = 0.575; AVE = 0.404), so its convergent validity and reliability were not supported. This factor consists of only two items (CDR3 and CDR9), which may contribute to unstable estimates, and it should be interpreted with caution.

Table 5. Result of Convergent Validity

Factor	CR	AVE	Description
Factor 1	0.884	0.489	Adequate CR; AVE below criterion
Factor 2	0.859	0.471	Adequate CR; AVE below criterion
Factor 3	0.854	0.542	Meets CR and AVE criteria
Factor 4	0.762	0.517	Meets CR and AVE criteria
Factor 5	0.575	0.404	Does not meet CR and AVE criteria

Reliability analysis indicated that the Connor-Davidson Resilience Scale (CD-RISC) had high internal consistency at the total-scale level. Cronbach's alpha for the total scale was 0.952, while McDonald's omega was 0.953, indicating very high internal consistency. These coefficients refer to the total scale and do not, by themselves, indicate that the five-factor structure was supported. In addition, the item-rest correlations for all items ranged from 0.498 to 0.777, meaning that all items met the discrimination criterion (> 0.30). The Cronbach's alpha if item deleted and McDonald's omega if item deleted analyses also showed that removing

any item did not meaningfully improve the instrument's reliability. Therefore, all 25 CD-RISC items were retained, and the total scale demonstrated high internal consistency.

Discussion

This study aimed to evaluate the psychometric characteristics of the Connor-Davidson Resilience Scale (CD-RISC) among individuals with chronic diseases in Indonesia. Overall, the findings provide only partial support for the CD-RISC in this population: all items had adequate factor loadings and the total scale showed high internal consistency, but the five-factor model fit was suboptimal and convergent validity was inadequate for some factors. These results are consistent with the view that resilience is a psychological capacity encompassing individuals' ability to adapt to stress, maintain psychological functioning, and recover when facing prolonged health conditions (Connor & Davidson, 2003); however, they do not confirm that this capacity is organized into the five dimensions proposed in the original scale.

The model evaluation also indicated that the theoretical structure of the CD-RISC did not fully capture the experience of resilience within a heterogeneous chronic disease population. This finding can be understood because individuals with chronic diseases face substantially more complex challenges than the general population. In addition to adapting to physical symptoms and changes in bodily functioning, they must also manage uncertainty regarding the course of illness, long-term treatment demands, changes in social roles, and persistent emotional distress (Brown et al., 2020; Janitra et al., 2024). Therefore, resilience within chronic disease populations is influenced not only by personal characteristics but also by interactions among clinical conditions (Zulkifli et al., 2024; CDC, 2026), social support (Chen et al., 2021; Upasen et al., 2024), and individuals' life experiences and psychological resources (Engel, 1977). Consistent with this, AVE values below 0.50 for Factors 1, 2, and 5 indicate that the items of these factors explained less than half of the variance in their intended factors, and the two-item spiritual influences factor (Factor 5) also had inadequate composite reliability. Because the sample combined diagnoses that differ in clinical and psychosocial characteristics, the misfit may partly reflect this heterogeneity; however, this explanation was not tested here and should be examined in future studies.

The findings of this study are also in line with CD-RISC validation studies indicating that internal consistency is generally high, whereas the factor structure is not always identical across cultures or clinical groups. Lubián-López et al. (2021) showed that the CD-RISC had good reliability among women with endometriosis, while Ningsih et al. (2023) obtained similar findings among patients with diabetes in Indonesia. More recent evidence similarly indicates that the factor structure of the CD-RISC may require modification when applied to different cultural populations. For example, a large Iranian validation study found that although the original five-factor model demonstrated acceptable fit, two items showed low factor loadings, leading to a modified 23-item structure (Karaırmak et al, 2010; Fu et al., 2014; Sharif Nia et al., 2023; Almanasef et al., 2024). This recurring pattern suggests that the structure of the CD-RISC may be context-dependent, making psychometric evaluation necessary before the instrument is used in a new population.

The instrument's high internal consistency indicates that the CD-RISC items are sufficiently related to one another to yield a total resilience score. This is in line with the conceptualization of Connor and Davidson (2003), who described resilience as a combination of psychological resources, including personal competence, the ability to manage pressure, acceptance of change, self-control, and spirituality. It is also consistent with previous evidence that the CD-RISC has generally demonstrated adequate to good reliability across diverse populations (Sharif Nia et al., 2024; Minnett & Stephenson, 2025). However, high alpha and omega at the total-scale level do not by themselves verify the five-factor structure, because they can also reflect a strong general factor. Conceptually, these five aspects remain relevant to how individuals with chronic diseases maintain psychological functioning and adapt to long-term changes in their health condition, but their empirical distinctiveness in this population requires further confirmation.

The main contribution of this study lies in the participant context. Most previous studies evaluated the CD-RISC in specific disease groups, such as diabetes or endometriosis, so the available psychometric evidence remains limited to specific clinical populations. This study extends that scope by involving adults aged 18–40 years with various types of chronic diseases, thereby providing an initial picture of CD-RISC performance in a heterogeneous clinical population. However, the sample was dominated by women (83.1%) and by autoimmune diseases (about 45%) and other chronic diseases (47.2%), whereas diabetes, hypertension, cancer, and heart disease together accounted for only 18 respondents (7.1%). The findings therefore cannot be generalized to all chronic disease groups or to disease-specific subgroups. They provide only preliminary evidence on the psychometric properties of the CD-RISC among Indonesian adults with chronic diseases, and

further evaluation, including refinement of the factor structure and measurement invariance testing across diagnostic groups, is necessary before the instrument is applied to specific clinical populations.

Conclusion

This study aimed to evaluate the construct validity and internal consistency of the Connor-Davidson Resilience Scale (CD-RISC) among Indonesian adults with chronic diseases. The findings showed that the total scale demonstrated high internal consistency and all items had acceptable factor loadings, whereas the five-factor model showed suboptimal fit (RMSEA, CFI, and TLI did not meet the criteria) and convergent validity was inadequate for some factors (AVE < 0.50 for Factors 1, 2, and 5; CR < 0.70 for Factor 5). These findings add preliminary evidence from a heterogeneous chronic disease sample, given that most previous studies focused on specific disease groups. Therefore, the CD-RISC total score can be used with caution as an internally consistent measure of resilience among Indonesian adults with chronic diseases, but the five-factor structure requires further refinement, and subscale scores should be interpreted cautiously. Future research should test alternative or modified models and measurement invariance that better reflect the clinical and cultural characteristics of different populations.

This study has several limitations that should be considered when interpreting the findings. First, the respondent characteristics were still dominated by women and several specific disease types, were restricted to adults aged 18–40 years, and included diagnostic groups too small for separate analysis (e.g., heart disease, n = 1), limiting representativeness across the broader chronic disease population. Second, combining different chronic disease diagnoses within a single measurement model may introduce variation in psychological characteristics that is not fully accommodated by the existing factor structure. Third, only evidence based on the internal structure was examined; discriminant and criterion validity, test–retest reliability, and measurement invariance were not evaluated. Therefore, the CD-RISC shows potential for measuring resilience among individuals with chronic diseases in Indonesia, but further studies are needed to refine the factor structure and examine measurement invariance across different populations.

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