Jurnal Psikologi Teori dan Terapan (JPTT)
2024, Vol. 15, No.03, 294-302
p-ISSN: 2087-1708; e-ISSN: 2597-9035
doi: https://doi.org/10.26740/jptt.v15n03.p294-302

Development of Resilience Measurement Tools in the Indonesian Cultural Context

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Article History

Submitted : September 17th, 2024

Final Revised : November 04th, 2024

Accepted : November 04th, 2024

Abstract

Background: Resilience is defined as a personal quality that allows a person to thrive in the face of adversity and the ability to survive in overcoming stress. In Indonesia, research on resilience instruments has been conducted, but it is still limited to population samples and is still specific to academic resilience. **Objective:** This study aims to modify the resilience measurement tool with the cultural context in Indonesia, namely The Connor-Davidson Resilience Scale (CD-RISC) with its five dimensions of personal competence, spirituality, self-acceptance, self-control, and self-confidence. **Method**: This study uses quantitative methods, data analysis used is factorial analysis with Confirmatory Factor Analysis (CFA), Multiple Indicators Multiple Causes (MIMIC). **Results**: The Connor-Davidson Resilience Scale (CD-RISC) is a model fit resilience measurement tool according to the Indonesian context which consists of 23 items with participants of student groups with undergraduate & postgraduate education levels. **Conclusion**: This study successfully modified and simplified the resilience measurement tool, The Connor-Davidson Resilience Scale (CD-RISC) into a fit model of resilience measurement tools according to the Indonesian context.

Keywords: Indonesian culture; resilience; measurement tools

Abstrak

Latar Belakang: Resiliensi didefinisikan sebagai kualitas pribadi yang memungkinkan seseorang berkembang dalam menghadapi kesulitan dan kemampuan bertahan dalam mengatasi stress. Di Indonesia sendiri penelitian mengenai instrumen resiliensi telah dilakukan, tetapi masih terbatas pada sampel populasi dan masih spesifik pada resiliensi akademik. **Tujuan:** Penelitian ini bertujuan untuk memodifikasi alat ukur resiliensi dengan konteks budaya di Indonesia, yaitu *The Connor-Davidson Resilience Scale* (CD-RISC) dengan lima dimensinya yaitu kompetensi pribadi, spiritualitas, penerimaan diri, kontrol diri, dan percaya diri. **Metode**: Penelitian ini menggunakan metode kuantitatif**,** Analisa data yang digunakan ialah analisa factorial dengan *Confirmatory Factor Analysis* (CFA), *Multiple Indicators Multiple Causes* (MIMIC). **Hasil**: *The Connor-Davidson Resilience Scale* (CD-RISC) menjadi model fit alat ukur resiliensi sesuai konteks Indonesia yang terdiri dari 23 item dengan partisipan kelompok mahasiswa dengan jenjang pendidikan S1 & S2. **Simpulan**: Penelitian ini berhasil memodifikasi dan menyederhanakan alat ukur resiliensi, *The Connor-Davidson Resilience Scale* (CD-RISC) menjadi model fit alat ukur resiliensi sesuai konteks Indonesia.

Kata Kunci: Budaya Indonesia; resiliensi; alat ukur

Introduction

Life in the university environment is a crucial phase for students who need to adapt to changes that affect their psycho-emotional aspects (Wang et al., 2014). Research shows that most university students experience high levels of stress and psychological distress, which can be attributed to complex academic and social demands (Saleh et al., 2017). Therefore, students need to have resilience to overcome these challenges. Resilience among college students can increase their tendency to use positive coping strategies, which in turn contributes to their mental health and psychological well-being (Wu et al., 2020).

Resilience is a personal attribute that enables a person to grow and thrive when faced with adversity and has the ability to remain stable in coping with stress (Connor & Davidson, 2003). Grotberg (2003) described resilience as an individual's ability to face challenges, overcome obstacles, learn, and thrive through life's difficulties. In addition, resilience also refers to an individual's capacity to bounce back and cope with adversity in a healthy and productive way (Reivich & Shatté, 2002).

The Connor-Davidson Resilience Scale (CD-RISC) developed by Connor and Davidson (2003) identifies five main aspects of resilience, namely personal competence, spirituality, self-acceptance, self-control, and self-confidence. Personal competence includes an individual's ability to control emotions and adapt to change. Spirituality reflects beliefs and values that give meaning to life. Self-acceptance is the ability to accept oneself, including weaknesses and strengths. Self-control is the ability to control oneself in the face of difficult situations. Self-confidence reflects an individual's belief in his or her ability to overcome adversity.

Several studies in various countries have developed instruments to measure the level of resilience. However, in Indonesia, research on resilience instruments is still limited. Some studies, such as those conducted by Hardiansyah et al. (2020) and Wahyudi et al. (2020), have tried to develop resilience instruments that are more in line with the cultural context in Indonesia. However, their research focus is still limited to academic resilience and limited population samples.

To fill this gap, this study aims to modify the existing resilience measurement tools to fit the Indonesian cultural context more thoroughly. In the Indonesian cultural context, resilience can be influenced by collective values such as *gotong royong*, patterns of close social relationships, and aspects of high religiosity. These local values shape the mindset, attitudes and ways of Indonesian individuals in responding to pressures and challenges, which is different from the Western cultural context that emphasizes individualism and personal resilience. The modification of this measuring instrument is expected to include relevant cultural aspects, such as collective values, spirituality, and social orientation, which may influence students' responses to challenges in the university environment. Thus, a more contextualized resilience instrument can help identify the unique factors that influence resilience of university students in Indonesia, providing the advantage of a more in-depth understanding that is appropriate to local cultural diversity.

Method

Sample or Population

The sampling technique used was nonprobability sampling with purposive sampling method. Nonprobability sampling is when the entire population is not known with certainty and not every member of the population has the same opportunity to be selected (Gravetter & Forzano, 2012). Purposive sampling, as explained by Jannah (2018) is a sampling technique tailored to the needs of researchers based on certain criteria.

Table 1. Demographic Data

Demographic		(N=369)	Precentage	Cumulative
Gender	Male	96	26,0%	26,0%
	Female	273	74,0%	100,0%
Education Level	Strata-1 (S1)	215	58,3%	58,3%
	Strata-2 (S2)	154	41,7%	100,0%
Cluster	Soshum	172	46,6%	46,6%
	Science and Technology	197	53,4%	100,0%
Major	Psychology	95	25,7%	25,7%
	Non Psychology	274	74,3%	100,0%
Regional	Java	185	50,1%	50,1%
	Outside Java	184	49,9%	100,0%
Migrate	Yes	223	60,4%	60,4%
	No	146	39,6%	100,0%
Pesantren	Yes	138	37,4%	37,4%
	No	231	62,6%	100,0%

Procedure

This research was approved by the Research Ethics Committee of the Faculty of Psychology, Gadjah Mada University Number: 3025/UN1/FPSi.1.3/SD/PT.01.04/2024. Data collection was conducted from April 17 to May 17, 2024 using Google Form. The data collected consisted of two parts: participant demographic data and the resilience scale. Demographic data included name, gender, education level, regional origin, education cluster, overseas status, and whether the participant had lived or was currently living in a pesantren. The purpose of collecting demographic data was to understand the characteristics of the participant population and analyze how demographic variables, such as overseas status or regional origin, might affect the level of resilience being measured. For example, this data allows researchers to see if there are differences in resilience levels based on certain factors such as educational background or previous living environment. Meanwhile, the resilience scale was completed by rating the statements provided using a Likert scale with five answer options, namely Strongly Agree (SS), Agree (S), Neutral (N), Disagree (TS), and Strongly Disagree (STS).

In the context of developing this resilience measurement tool, data analysis was conducted using software that has an open-source license, namely Jamovi version 2.3.28 and JASP version 0.18.3.0 for various analytical procedures. The techniques used included Confirmatory Factor Analysis (CFA), which serves to test the extent to which the empirical data conforms to a previously established theoretical factor structure (Brown, 2015). In CFA, a number of model fit parameters are used, including Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) to determine absolute and incremental model fit (Hair et al., 2019). In addition, Multiple Indicators Multiple Causes (MIMIC), an approach in Structural Equation Modeling (SEM), was used to link multiple indicators with multiple causes (Shi et al., 2020).

Data Measurement

The measuring instrument that will be used in this study is a modification of Connor and Davidson's (2003) resilience scale, The Connor-Davidson Resilience Scale (CD-RISC). It consists of five aspects or dimensions, namely personal competence, spirituality, self-acceptance, self-control, and self-confidence. Initially this resilience scale modification consisted of a total of 75 items before the fit model, then became 23 fit model items after several model analyses (Table 2).

Table 2. Resilience Scale Blueprint

No.	Aspects	Indicator	Percentage		Aitem	
			Initial	End	Initial	End
1	Personal Competence	Have good adaptability skills Ability to overcome challenges and complete tasks Ability to respond to feedback	20%	27%	1, 2, 3, 16, 17, 18, 28, 29, 38, 39, 49, 50, 51, 64, 65	1, 2, 3, 17, 28
2	Spirituality	Having a sense of meaning and purpose in life Able to reflect on the meaning of life through spirituality activities Having faith in God's strength and power	20%	13%	4, 5, 6, 19, 20, 30, 31, 40, 41, 42, 52, 53, 54, 66, 67	5, 6, 20, 67
3	Self-acceptance	Able to see the positive side of one's own shortcomings Have an overall positive view of oneself Have an awareness of one's own strengths and be able to utilize them	20%	20%	7, 8, 9, 21, 22, 32, 33, 43, 44, 55, 56, 57, 68, 69, 70	7, 8, 9, 21, 57
4	Self-control	Have the ability to manage emotions and good self-control Able to take responsibility for own actions and decisions Able to maintain commitment until goals are achieved	20%	27%	10, 11, 12, 23, 24, 34, 35, 36, 45, 46, 58, 59, 60, 71, 72, 75	10, 11, 12, 35, 46
5	Self-confidence	Have a strong belief in one's own ability and value Ability to speak and act confidently in a variety of situations Able to face challenges and obstacles without hesitation	20%	13%	13, 14, 15, 25, 26, 27, 37, 47, 48, 61, 62, 63, 73, 74	14, 25, 26, 74

Result

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a statistical analysis technique used to test the extent to which empirical data match a predetermined theoretical factor structure (Brown, 2015). CFA interpretation involves examining several model fit indices, such as Comparative Fit Index (CFI) > 0.9, Tucker-Lewis Index (TLI) > 0.9, Root Mean Square Error of Approximation (RMSEA) < 0.6, and Standardized Root Mean Square Residual (SRMR) < 0.6 (Hair et al., 2019). These indices help assess the extent to which the hypothesized model fits the observed data and can be described as model fit. The Skewness and Kurtosis

normality test was carried out twice, namely before the full item version of the CFA test and the item reduction version of CFA (Table 3) to ensure that the data used in the analysis met the assumptions of normal distribution (Sintia et al., 2022). Skewness and Kurtosis values that are in the range of -2 to 2 are considered an indication that the data has a normal distribution (Kim, 2013).

Table 3. Skewness and Kurtosis of Item Reduction Version

Descriptives

				Skewness		Kurtosis	
	N	Mean	SD	Skewness	SE	Kurtosis	SE
ITEM1	369	3.99	0.74	-0.62	0.12	1.16	0.25
ITEM2	369	4.07	0.71	-0.55	0.12	0.68	0.25
ITEM3	369	4.14	0.69	-0.48	0.12	0.42	0.25
ITEM5	369	4.30	0.77	-1.18	0.12	1.92	0.25
ITEM6	369	3.90	0.84	-0.59	0.12	0.29	0.25
ITEM7	369	3.92	0.85	-0.51	0.12	-0.06	0.25
ITEM8	369	4.21	0.78	-0.99	0.12	1.47	0.25
ITEM9	369	3.92	0.86	-0.789	0.127	0.9388	0.25
ITEM10	369	3.43	0.93	-0.158	0.127	-0.4181	0.25
ITEM11	369	4.22	0.71	-0.89	0.12	1.79	0.25
ITEM12	369	4.02	0.77	-0.53	0.12	0.22	0.25
ITEM14	369	4.29	0.76	-1.09	0.12	1.82	0.25
ITEM17	369	3.98	0.69	-0.41	0.12	0.59	0.25
ITEM20	369	3.54	0.94	-0.25	0.12	-0.19	0.25
ITEM21	369	3.98	0.82	-0.89	0.12	1.41	0.25
ITEM25	369	4.01	0.74	-0.73	0.12	1.48	0.25
ITEM26	369	2.78	1.10	0.18	0.12	-0.68	0.25
ITEM28	369	3.81	0.76	-0.37	0.12	0.14	0.25
ITEM35	369	3.83	0.76	-0.22	0.12	-0.11	0.25
ITEM46	369	4.14	0.75	-0.72	0.12	0.82	0.25
ITEM57	369	3.17	1.03	-0.34	0.12	-0.38	0.25
ITEM67	369	3.93	1.24	-1.02	0.12	0.02	0.25
ITEM74	369	3.27	0.93	-0.25	0.12	-0.09	0.25

Table 3 shows Skewness and Kurtosis values that are within the range of -2 to 2, indicating normal data distribution (Kim, 2013).

Table 4. Comparison of Model Fit Measures

Model	X^2	df	CFI	TLI	RMSEA	SRMR
CFA full item version	10940	2690	0.44	0.42	0.12	0.09
CFA item reduction version	476	220	0.91	0.90	0.05	0.04

Note. CFI > 0.9; TLI > 0.9; RMSEA < 0.6; SRMR < 0.6.

From (Table 4) above, it can be seen that the item reduction version of the CFA model shows a better fit than the full item version of the CFA model. The lower values of chi-square (X^2) and degrees of freedom (df) in the item reduction model indicate that this model is better. In addition, higher values of fit indices such as CFI and TLI and lower values of RMSEA and SRMR in the item reduction model indicate that this model provides a better representation of the hypothesized factor structure.

The item reduction process is carried out in several stages. First, an initial confirmatory factor analysis (CFA) was conducted on all 75 items. Based on the model fit evaluation results, several items that had low loading factors and did not meet the index fit values (CFI > 0.9, TLI > 0.9, RMSEA < 0.6, SRMR < 0.6) were identified for reduction. Next, a residual correlation analysis was conducted to evaluate whether any items had high local correlations, indicating redundancy between items. Some items that had a residual correlation of more than 0.3 were then eliminated to improve local independence. In other words, item reduction not only simplified the model but also improved the fit of the model to the existing data. This led to a total of 75 items to 23 fit items.

Multiple Indicators Multiple Causes (MIMIC)

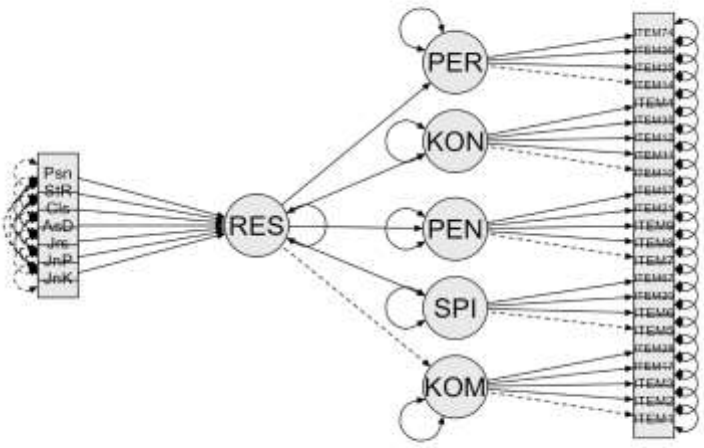
The Multiple Indicators Multiple Causes (MIMIC) model is one approach in Structural Equation Modeling (SEM) analysis that links multiple indicators with multiple causes (Shi et al., 2020). This model is often used to measure latent variables that cannot be observed directly through several observational indicators. MIMIC model interpretation references include identifying the relationship between latent variables and dimensions referring to the Comparative Fit Index (CFI) value > 0.9, Tucker-Lewis Index (TLI) > 0.9, Root Mean Square Error of Approximation (RMSEA) < 0.6, and Standardized Root Mean Square Residual (SRMR) < 0.6, and the relationship between dimensions and covariates (demographics) referring to the value < 0.05 (Schumaker & Lomax, 2016).

Table 5. MIMIC Model 1

Model	X^2	df	CFI	TLI	RMSEA	SRMR
Mimic Gender	506.18	238	0.90	0.89	0.05	0.04
Mimic Education Level	495.28	238	0.91	0.89	0.05	0.04
Mimic Regional	506.50	238	0.91	0.90	0.05	0.04
Mimic Cluster	511.64	238	0.91	0.89	0.05	0.04
Mimic Major	501.77	238	0.90	0.89	0.05	0.04
Mimic Migrate	503.67	238	0.91	0.89	0.05	0.04
Mimic Pesantren	585.02	247	0.91	0.89	0.05	0.04

Note. CFI > 0.9; TLI > 0.9; RMSEA < 0.6; SRMR <0.6.

Figure 1: Diagram of the MIMIC Model 1



The Mimic 1 model (Table 5) and (Figure 1) shows that all the covariate models (demographics) have a good fit, but demographics by regional origin has the best fit model when compared to the other covariate data.

Table 6. MIMIC Model 2

Variable	Personal Comptence	Self-Control	Self-Acceptance	Self-Confidence	Spirituality
Gender	0.00	0.03	0.08	0.48	0.04
Education Level	< 0.00	0.00	0.00	< 0.00	< 0.00
Regional	0.06	0.09	0.03	0.05	0.24
Cluster	0.84	0.61	0.29	0.87	0.09
Major	0.35	0.75	0.84	0.13	073
Migrate	0.00	0.02	0.11	0.01	0.07
Pesantren	0.01	0.03	0.09	0.02	0.96

Note. GR : 0 = Male, 1 = Female; EL : 0 = S1, 1 = S2; RL : 0 = Outside Java, 1 = Java; CL : 0 = Soshum, 1 = Science and Technology; MR : 0 = Psychology, 1 = Non Psychology; ME : 0 = Yes, 1 = No; PS : 0 = Yes, 1 = No. Sig < 0.05.

After conducting a model fit test based on covariates (demographics) (Figure 1), a mimic model test was then conducted to see the effect of covariate data on each aspect/dimension. The Mimic 2 model (Table 6) shows that some covariates have an effect or bias on the dimensions. Gender (GD) has a sig result <0.05 on Personal Competence (PC), Self-Control (SC), and Spirituality (SP), this means that women tend to have higher scores than men in these three dimensions. Educational Level (EL) has a sig < 0.05 on all dimensions, which means that subjects with an undergraduate education (S2) have higher scores than subjects with an undergraduate education (S1) on all dimensions.

Regional Origin (RO) has a sig < 0.05 on the Self-Acceptance (SA) dimension, which means that subjects from Java have higher scores than subjects from outside Java. Rantauan Status (RS) has a sig < 0.05 on the dimensions of Personal Competence (PC), Self-Control (SC), Self-Confidence (SC), which means that subjects who are not overseas have higher scores than subjects who migrate. Pesantren has a sig value <0.05 on the dimensions of Personal Competence (PC), Self-Control (SC), Self-Confidence (SC), which means that subjects who have never or are not currently living in pesantren have higher scores than subjects who have or are living in pesantren.

Meanwhile, the covariates Cluster (CL) and Department (DE) have a sig value> 0.05 in all dimensions, which means that the categorization in the covariates does not affect the items in all dimensions.

Discussion

This study aims to modify the resilience measurement tool in the Indonesian cultural context, namely The Connor-Davidson Resilience Scale (CD-RISC), which consists of five dimensions: personal competence, spirituality, self-acceptance, self-control, and self-confidence. Data analysis was conducted using factor analysis with Confirmatory Factor Analysis (CFA), and Multiple Indicators Multiple Causes (MIMIC). In CFA analysis, researchers use various fit indices such as Comparative Fit Index (CFI) > 0.9, Tucker-Lewis Index (TLI) > 0.9, Root Mean Square Error of Approximation (RMSEA) < 0.06, and Standardized Root Mean Square Residual (SRMR) < 0.06 (Hair et al., 2019). These indicators are used to assess the extent to which the theoretical model fits the empirical data. The results of the analysis showed that the item reduction model consisting of 23 items showed a better fit than the full item model consisting of 75 items. The increase in CFI and TLI values, as well as the decrease in RMSEA and SRMR values in the item reduction model, indicated that item reduction not only simplified the model, but also improved the fit of the model to the data. This indicates that the modified resilience scale is more appropriate for describing resilience dynamics in the Indonesian cultural context.

Furthermore, MIMIC Model analysis was used to identify the influence of demographic covariates on the measured dimensions. The results of MIMIC Model 1 (Table 5) show that all covariate models showed a good fit, with the covariate of regional origin showing the best fit model compared to the other covariates. MIMIC Model 2 (Table 6) reveals that some covariates, such as gender, education level, regional origin, overseas status, and pesantren, have a significant effect with a sig value > 0.05 on a particular dimension. For example, the education level shows that subjects with a master's degree have higher scores on all dimensions compared to subjects with a bachelor's degree. Meanwhile, in the Cluster and Department

covariates, the sig value > 0.05 in all dimensions indicates that the categorization in the covariates does not affect the items in all dimensions (Schumaker & Lomax, 2016).

The significance of these covariates in the Indonesian cultural context suggests that demographic factors not only influence individual resilience, but also reflect the different values and norms that exist in society. Therefore, it is important to conduct further studies that support existing theories and literature to strengthen the understanding of how cultural context affects the results of the MIMIC model in measuring resilience.

Conclusion

This study successfully modified and simplified the resilience measurement tool, The Connor-Davidson Resilience Scale (CD-RISC), to better fit the cultural context in Indonesia. Through various analyses such as Confirmatory Factor Analysis (CFA), and Multiple Indicators Multiple Causes (MIMIC). The final result of this research produced a more valid and reliable resilience measurement tool according to the Indonesian context with 23 items. Thus, this study makes a significant contribution in the development of valid and reliable measurement tools, which can be used for further research in relevant fields.

The results showed that some items were eliminated because they did not meet the validity and reliability criteria. Future research is recommended to develop new items that are more specific by taking into account various social, cultural, and demographic factors in Indonesia, so that the measuring instrument can be more sensitive to individual differences and certain contexts.

Demographic factors such as regional origin and education level have been found to influence resilience dimensions. A suggestion for future research is to explore more deeply how other demographic factors, such as occupation, economic status, or life experiences, may influence resilience. This could help researchers better understand the dynamics of resilience in different groups of people in Indonesia.

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