Psychometric Properties Of The Perceived Stress Scale (PSS-10) In Indonesian Version

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Abstract

The Perceived Stress Scale (PSS-10) by Cohen is a popular tool for measuring stress from a psychological perspective. The PSS-10 measures the extent to which situations in a person's life are perceived as stressful. This study aims to evaluate the psychometric properties of the Perceived Stress Scale adapted to Indonesian. The PSS-10 has been translated into various languages. However, there has been a scarcity of previous studies specifically exploring the psychometric properties of the PSS-10 in Indonesian. Additionally, this study seeks to test the construct invariance of the PSS-10 among students and workers. The respondents of this study were employees working in several regions in Indonesia (N=259) and college students (N=244). Data analysis was conducted using Confirmatory Factor Analysis (CFA) and Measurement Invariance (MI). After testing for validity based on internal structure, the Indonesian version of the PSS-10 fit the two-factor model (perceived helplessness and perceived self-efficacy). The AVE value of 0.38 for student participants was considered low, with a CR value of 0.81, which is quite good. For employee participants, the AVE value was 0.58, and the CR value was 0.93, both of which were good. Based on the multigroup CFA analysis test, there are differences in the factor structure of the PSS-10 between students and employees, where these differences lie in how the two groups respond to and interpret the items of the PSS-10.

Keywords: perceived stress, perceived helplessness, perceived self-efficacy

Abstrak

Skala Perceived Stress (PSS-10) dari Cohen merupakan salah satu alat ukur stres yang cukup populer untuk mengukur stres dari perspektif psikologis. PSS-10 mengukur sejauh mana situasi dalam kehidupan seseorang dinilai sebagai stres. Penelitian ini bertujuan untuk mengevaluasi properti psikometri Skala Perceived Stress yang diadaptasi ke dalam bahasa Indonesia. PSS-10 telah diterjemahkan ke dalam berbagai bahasa, namun belum ada penelitian sebelumnya yang secara khusus mengeksplorasi properti psikometrik PSS-10 dalam bahasa Indonesia. Penelitian ini juga ingin menguji invariansi konstruk PSS-10 pada kelompok mahasiswa dan pekerja Responden penelitian ini adalah karyawan yang bekerja di beberapa daerah di Indonesia (N=259), serta mahasiswa perguruan tinggi (N=244). Analisis data menggunakan Confirmatory Factor Analysis (CFA) dan Measurement Invariance (MI). Setelah dilakukan pengujian validitas berdasarkan struktur internal, PSS-10 versi bahasa Indonesia fit terhadap model dua faktor (perceived helplessness dan perceived self-efficacy). Nilai AVE=0.38 pada partisipan mahasiswa tergolong rendah, dengan nilai CR=0.81 yang cukup baik. Sedangkan pada partisipan karyawan, nilai AVE=0.58 dan CR=0.93 sama-sama baik. Berdasarkan uji analisis CFA multigrup menunjukkan adanya perbedaan dalam struktur faktor PSS-10 antara mahasiswa dan karyawan, di mana perbedaan tersebut terletak pada cara kedua kelompok tersebut merespons dan menginterpretasi item-item PSS-10.

Kata Kunci: perceived stress, perceived helplessness, perceived self-efficacy

Introduction

Everyone generally experiences stress at some point or under various circumstances, whether in a school, workplace, or community environment. Engaging in critical grade-promotion exams, job selection processes for coveted positions, tight deadlines at work, receiving reprimands from superiors for errors or failing to meet targets, and especially news of job terminations can undoubtedly trigger stress. Furthermore, prolonged stress can affect several psychological aspects, including 1) Affective regulation, such as anxiety, fear, and depression. 2) Health behaviors, including poor nutrition, reluctance to exercise, alcohol consumption, increased smoking, and sleep deprivation. 3) Disturbances in the neurohormonal system, which resulted in changes in hormones like testosterone, cortisol, and estrogen. 4) Increased sympathetic nervous system activity leading to elevated norepinephrine release (Cohen et al., 2019). These aspects can impact brain function, the heart, the liver, and various bodily systems, such as the immune system, endocrine system, cancer, diabetes, and cardiovascular health (Cohen et al., 2019; Lee, 2012). Stress can also contribute to burnout (King, 2011; Lee et al., 2019; Tziner et al., 2015; Wu et al., 2021).

Stress is an individual's response to environmental pressures, circumstances, and events that threaten well-being and disrupt goal attainment (Cohen et al., 2019; King, 2011). Meanwhile, work-related stress refers to the experience of stress in the workplace. Role conflict is the primary source of work-related stress (King, 2011). Role conflict occurs when an individual must choose between fulfilling two or more important obligations. Because job demands often clash with other demands, it can be challenging to juggle these diverse roles. According to King (2011), four job characteristics are associated with work-related stress: 1) High job demands, such as a heavy workload and time pressure. 2) Lack of opportunities for involvement in decision-making. 3) Excessive control by superiors. 4). Uncertainty about performance competence criteria. Cohen et al. (2019) argue that stress is an individual's assessment of a situation as stressful. Such situations can occur unexpectedly, unpredictably, and excessively.

Stress can be assessed through three main approaches: (1) general assessments related to perceived stress, (2) event assessments, and (3) cognitive appraisal assessments. General assessments related to perceived stress aim to describe evaluations of the level of perceived stress not tied to specific recent events. Event assessments examine experiences of significant life events, challenges, and acute single stressful events. Cognitive appraisal assessments evaluate primary appraisals (the extent to which an event is perceived as a threat, challenge, or potential loss) and secondary appraisals (e.g., the extent to which an event is perceived as controllable) (Abraham et al., 2016). Cohen, Kessler, and Kopp (as cited in Lee, 2012) identified that the concept of assessing stress in research can be classified into three perspectives: (1) environmental, focusing on the causes of stress or a specific event; (2) psychological, concentrating on subjective stress assessments and affective reactions; (3) biological, centering on the assessment of physiological systems, including responses to stress. This aligns with Cox's view (as cited in Abraham et al., 2016) that there are three approaches to studying stress: (1) the stimulus or environmental approach, (2) the response or physiological approach, and (3) the assessment of the psychological interaction approach. Some of the commonly developed general stress measurements include the Stress Arousal Checklist (SACL) (Mackay et al., 1978; Mccormick et al., 1985), the Trier Inventory of Chronic Stress (TICS) by Schulz, Schlotz, and Becker (as cited in Abraham et al., 2016).

Additionally, there is the Perceived Stress Scale (PSS) by Cohen, one of the popular instruments for measuring stress from a psychological perspective (Lee, 2012). The PSS measures the extent to which situations in a person's life are perceived as stressful. Initially, the PSS consisted of 14 items (Cohen et al., 1983). Then 1988, Cohen and Williamson conducted a validity test on the Perceived Stress Scale using varimax rotation. They found ten items had good factor loadings, while four had low factor loadings, including items 4, 5, 12, and 14 (Cohen & Williamson, 1988). This scale asks participants to describe their thoughts and feelings about non-specific events over the past month. Questions such as "How often have you felt anxious and stressed?" and "How often have you felt unable to control important things in your life?" have been asked. The PSS is a global or general measuring tool. According

to Cohen et al. (2019), globally oriented scales have many advantages, including: First, such measurements allow for estimating increased risk associated with easily identifiable events. Second, measurement procedures are often simple. For example, did this event occur in the last month? Individuals experiencing specific events can often be identified without asking specific questions (for example, people living in noisy communities). Third, various subjective biases in the perception and reporting of events are minimized by this measurement method.

Several studies related to the psychometrics of the PSS-10 with student participants have been conducted in several countries, including students living in dormitories and personality class introductions in America (Cohen et al., 1983), psychology students in Mexico (Ramírez & Hernández, 2007), students in Turkey (Örücü & Demir, 2009), and medical students in Thailand (Wongpakaran & Wongpakaran, 2010). In addition to students, the PSS-10 has also been extensively studied among workers, including workers in France (Lesage et al., 2012), teachers, and technical workers (Almadi et al., 2012).

The PSS has been translated into various languages, including Spanish (Remor, 2006), Chinese (Ng, 2013), Japanese (Mimura & Griffiths, 2008), Turkish (Örücü & Demir, 2009), Thai (Wongpakaran & Wongpakaran, 2010), Arabic (Chaaya et al., 2010), Australian (Santiago et al., 2020), and French (Lesage et al., 2012). Although many researchers have validated the Perceived Stress Scale in various languages, validation in the Indonesian language version has not yet been found. This study aims to evaluate the psychometric properties of the Perceived Stress Scale (PSS-10) in the Indonesian language version. PSS-10 was found to have better reliability and validity than PSS-14, so the researchers preferred to use PSS-10 in this study. The professions of participants in previous studies have been highly diverse. However, there have been relatively few studies involving participants in college students and working professionals with the psychometric properties of the Indonesian language version. Additionally, this study also aims to test the construct invariance of the PSS-10 among groups of students and workers. Therefore, the researchers intend to conduct a study on the psychometric properties of the PSS-10 in the Indonesian language version with college students and working professionals as participants.

Methods

Procedure

The adaptation process of PSS-10 into the Indonesian language followed Beaton et al. theory (2000). The PSS-10 was adapted into Indonesian by involving four English language experts and ten employees who participated in the readability test. The scale translation process began with a forward translation method from English to Indonesian by two different translators, followed by synthesis. The next step was to perform a backward translation from the synthesis results by two different translators back into English. The next stage involves an expert committee, engaging a researcher and a lecturer in the Faculty of Psychology who better understand the concept of stress. The following stage involved a readability test with ten respondents. The respondents who participated in the readability test were individuals working in companies or organizations and psychological students. The readability test aimed to provide information on which words in sentences were difficult for readers to understand. This feedback from readers could be useful for researchers to improve sentences that were challenging to comprehend, hoping that the sentences would be more easily understood in Indonesian culture after these improvements.

The measurement tool used in the study is the Perceived Stress Scale (PSS-10) developed by Cohen et al. (Cohen et al., 1983). The PSS consists of two main dimensions: perceived helplessness and self-efficacy. The scale in this study consists of 10 items with a 5-point Likert scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often).

The construct validity of PSS-10 was assessed using Confirmatory Factor Analysis (CFA) and Measurement Invariance (MI). CFA is a structural equation modeling (SEM) method that focuses on

measurement models. It examines the relationships between observed indicators, such as test items, scores, or behavioral ratings, and the underlying latent variables or factors they are intended to measure (Brown, 2015). CFA was used to confirm whether the construct indicators are valid indicators of the latent construct (Latan, 2013). Because the latent variables used in the research were formed based on theoretical concepts with several indicators or manifests, it is necessary to test whether these indicators measure the unidimensionality of a latent concept (Ghozali, 2017). In addition to CFA, this study tests the measurement invariance of status (employees and students). Multigroup analysis examines the measurement invariance of status (employees and students). Multigroup analysis is the process of fitting a model by defining the model based on the number of groups being tested (Widhiarso, 2011). This test yields model fit indices (e.g., TLI and chi-square) that apply to both groups. High model fit values indicate that the tested model will produce consistent or stable results when applied to the involved groups. In statistics, this consistent result is called invariance (Widhiarso, 2011). CFA tests and multigroup analysis in this study use the JASP 0.16.4.0 software.

Several measures are used to assess the model's goodness of fit, which is an indication of the comparison between the specified model and the covariance matrix among indicators or observed variables. If the goodness of fit produced by a model is good, then the model can be accepted, and conversely, if the model is poor, it should be rejected. The model fit indices used in this study are chi-square (χ^2), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), and Tucker–Lewis Index (TLI) (Wang & Wang, 2020). The standards used for the fit indices in this study are RMSEA < 0.08 (Schumacker & Lomax, 2010), CFI and TLI > 0.90 (Kline, 2016; Schumacker & Lomax, 2010), and SRMR < 0.080 (Wang & Wang, 2020).

The magnitude of factor loadings on each item in this study also receives significant consideration. High loadings on a factor indicate that they cluster at the same point, namely the latent construct. At a minimum, all factor loadings must be statistically significant. A good rule of thumb is that standardized loading estimates should be 0.5 or higher (Hair et al., 2014). The calculation of average variance extracted (AVE) is used to evaluate construct convergence in CFA. AVE is calculated as the total of all squared standardized factor loadings (squared double correlations) divided by the number of items. AVE values of 0.5 or higher indicate adequate convergence (Hair et al., 2014). Construct reliability (CR) is often used alongside SEM models. CR is calculated from the sum of squared factor loadings for each construct and the sum of error variances. A value of 0.7 indicates good reliability, while reliability between 0.6 and 0.7 can be acceptable if other model construct validity indicators are good (Hair et al., 2014).

The data for this study were collected using a scale administered to psychology students and employees in Indonesia. The number of participants who were employees was 259, while the number of participants who were psychology students totaled 244. The sample size in this study meets the criteria outlined by Hair et al. (2014), where a minimum sample size of 100 is required. Comrey and Lee (2013) also established criteria for sample size sufficiency as follows: 50 is very inadequate; 100 is inadequate; 200 is adequate; 300 is sufficient; 500 is very sufficient; and 1000 or more is highly satisfactory. The sampling method employed in this research was convenience sampling, where the research questionnaire was provided to employees who were willing to complete the given scale. Data collection took place from January to November 2023.

Respondent

Respondent demographic data is presented in Table 1.

Table 1. Demographic data of respondent

Category	Employee (N= 259)	Frequency (%)	Student (N= 244)	Frequency (%)
Gender				
Male	134	51.7%	46	18.9%
Female	125	48.3%	198	81.1%
Occupation Type				
Entrepreneurship	14	5.41%	-	-
Private Employees	214	82.6%	-	-
BUMN employees	7	2.7%	-	-
Civil servants	24	9.27	-	-
Last Education				
Junior High School	6	2.3%	0	0%
Senior High School	188	72.6%	235	96.3%
Diploma	9	3.5	1	0.4%
Bachelor Degree	39	15.1%	8	3.27%
Masters's Degree	15	5.79%	0	0%
Doctoral Degree	2	0.77%	0	0%

Sources: Personal Data (2024).

## Results and Discussion

Results

Study 1 with Students

The two-dimensional construct was confirmed by conducting a CFA approach to ensure whether the construct indicators are valid indicators of the latent construct. The analysis results using JASP software indicate that the Loading Factor values for all PSS-10 items range from 0.35 to 0.745. This suggests that items with a Loading Factor > 0.5 are considered good and can be retained, except for item number 7 (0.35), which has a marginal Loading Factor value, as observed in Table 2 and Figure 1.

Table 2. Loading Factor in the CFA Model of PSS-10

Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	95% Confidence Interval		Std. Est. (all)
							Lower	Upper	
Factor 1	Item 1	λ_{11}	0.654	0.035	18.628	< .001	0.585	0.723	0.654
	Item 2	λ_{12}	0.706	0.034	20.754	< .001	0.640	0.773	0.706
	Item 3	λ_{13}	0.745	0.036	20.720	< .001	0.675	0.816	0.745
	Item 6	λ_{14}	0.567	0.036	15.931	< .001	0.497	0.637	0.567
	Item 9	λ_{15}	0.573	0.034	16.666	< .001	0.505	0.640	0.573
	Item 10	λ_{16}	0.644	0.033	19.381	< .001	0.579	0.709	0.644
Factor 2	Item 4	λ_{21}	0.685	0.051	13.538	< .001	0.586	0.784	0.685
	Item 5	λ_{22}	0.556	0.047	11.953	< .001	0.465	0.648	0.556
	Item 7	λ_{23}	0.350	0.042	8.269	< .001	0.267	0.433	0.350
	Item 8	λ_{24}	0.637	0.048	13.170	< .001	0.542	0.731	0.637

Sources: Personal Data (2024).
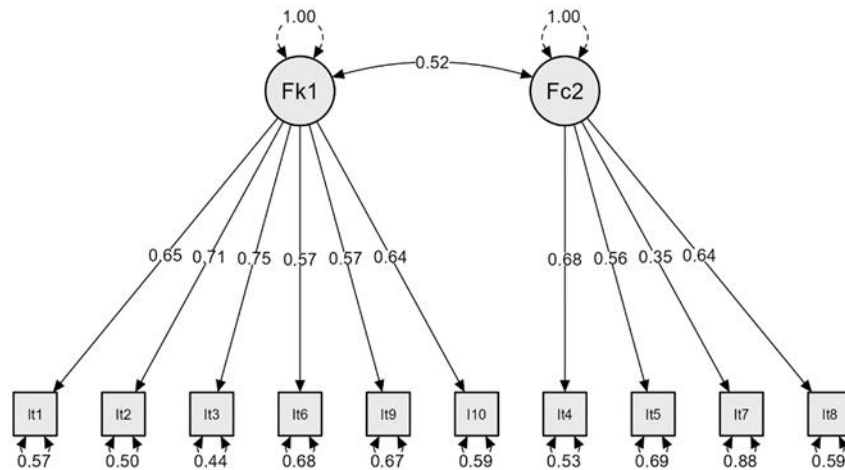
Sources: Personal Data (2024).

Figure 1. Two-factor PSS-10 CFA model

The values of CFI, TLI, and SMR meet the criteria. For CFI and TLI, all are >0.9. However, the p-value is <0.05, and RMSEA is 0.094, still greater than 0.08 (Table 3). After removing item 7, there is an improvement in the Goodness of Fit (GOF) results for all aspects, especially in the aspect of RMSEA = 0.054 (CI = 0.024; 0.080). Although the Chi-square value indicates that the model does not fit, this index often does not fit due to its sensitivity to sample size (Umar & Nisa, 2020). Other fit indicators such as RMSEA, CFI, TLI, and SMR indicate that this model fits the data. Therefore, despite one indicator not meeting the criteria, this model is considered a good fit based on other indicators, as seen in Table 4.

Table 3. Results of Model Suitability Testing (Goodness of Fit)

Fit Indicator	Criteria	Research Result	Information
Chi-square	>0.05	< 0.00	Do not Fit
RMSEA	< 0.08	0.094 [0.075 – 0.115]	Do not Fit
CFI	>0.9	0.954	Fit
TLI	>0.9	0.939	Fit
SMR	< 0.08	0.077	Fit

Sources: Personal Data (2024).

Table 4. Results of Model Suitability Testing (Goodness of Fit) after Modification

Fit Indicator	Criteria	Research Result	Information
Chi-square	>0.05	< 0.015	Do not Fit
RMSEA	< 0.08	0.054 [0.024 – 0.080]	Fit
CFI	>0.9	0.988	Fit
TLI	>0.9	0.983	Fit
SMR	< 0.08	0.056	Fit

Sources: Personal Data (2024).

Based on the factor loadings, the AVE values for student participants reveal that perceived helplessness has a value of 0.42 and perceived self-efficacy has a value of 0.32, with a total AVE of 0.38. Since the AVE value is below 0.50, it signifies low convergent validity. This also suggests that the constructs may not adequately explain the variance of their indicators, and there may be items that do not truly reflect the "perceived stress" construct among student participants. As for the CR values, perceived helplessness has a value of 0.81, indicating good internal consistency for the items measuring this factor. On the other

hand, perceived self-efficacy has a value of 0.64, slightly lower than perceived helplessness. This might indicate greater variation in the internal consistency of the items used to measure perceived self-efficacy. The total CR of 0.85 indicates that overall, the measured scale or constructs have good internal consistency, and the items can be relied upon to measure perceived stress among students.

Study 2 with Employees

The two-dimensional construct was confirmed by conducting a CFA approach to ensure whether the construct indicators are valid indicators of the latent construct. The analysis results using JASP software indicate that the Loading Factor values for all PSS-10 items range from 0.574 to 0.837. This suggests that all items have strong Loading Factor values (>0.5) and can be retained, as observed in Table 5 and Figure 2.

Table 5. Loading Factor in the CFA Model of PSS-10

Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	95% Confidence Interval		Std. Est. (all)
							Lower	Upper	
Factor 1	Item 1	λ11	0.797	0.021	37.264	< .001	0.755	0.839	0.797
	Item 2	λ12	0.780	0.021	37.473	< .001	0.739	0.821	0.780
	Item 3	λ13	0.808	0.021	38.184	< .001	0.767	0.850	0.808
	Item 6	λ14	0.703	0.021	32.718	< .001	0.660	0.745	0.703
	Item 9	λ15	0.792	0.021	37.520	< .001	0.750	0.833	0.792
	Item 10	λ16	0.837	0.021	39.352	< .001	0.796	0.879	0.837
Factor 2	Item 4	λ21	0.779	0.030	26.085	< .001	0.721	0.838	0.779
	Item 5	λ22	0.728	0.029	25.081	< .001	0.672	0.785	0.728
	Item 7	λ23	0.574	0.029	19.945	< .001	0.518	0.630	0.574
	Item 8	λ24	0.837	0.030	27.828	< .001	0.778	0.896	0.837

Sources: Personal Data (2024).
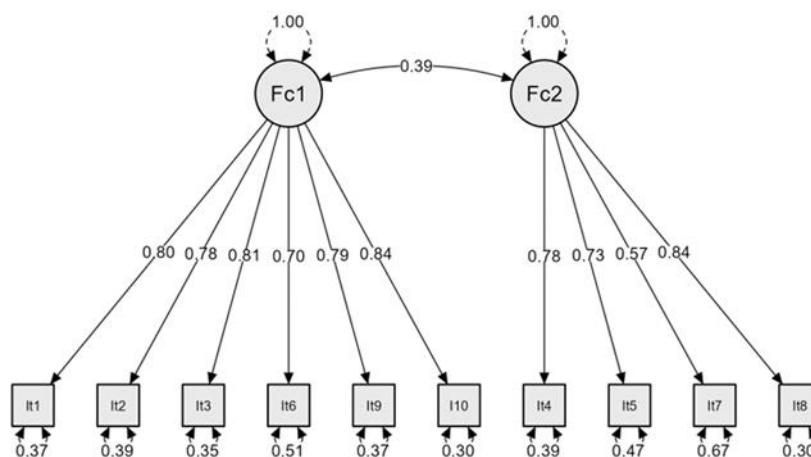
Sources: Personal Data (2024).

Figure 2. Two-factor PSS-10 CFA model

The Goodness of Fit (GOF) results for all aspects meet the criteria. For CFI and TLI, they are all >0.9. However, the p-value is <0.05, and RMSEA >0.08. Nevertheless, the scale is considered a good fit because it exhibits strong GOF values, as shown in Table 6. After making residual variance modifications on items 7 and 8, 1, and 3 obtained better GOF results, as shown in Table 7. Although the Chi-square

value indicates that the model does not fit, this index often does not fit due to its sensitivity to sample size (Umar & Nisa, 2020). Other fit indicators such as RMSEA, CFI, TLI, and SMR indicate that this model fits the data. Therefore, despite one indicator not meeting the criteria, this model is considered a good fit based on other indicators.

Table 6. Results of Model Suitability Testing (Goodness of Fit)

Fit Indicator	Criteria	Research Result	Information
Chi-square	>0.05	< 0.00	Do not Fit
RMSEA	< 0.08	0.113 [0.095 – 0.132]	Do not Fit
CFI	>0.9	0.982	Fit
TLI	>0.9	0.977	Fit
SMR	< 0.08	0.069	Fit

Sources: Personal Data (2024).

Table 7. Results of Model Suitability Testing (Goodness of Fit) after Modification

Fit Indicator	Criteria	Research Result	Information
Chi-square	>0.05	< 0.01	Do not Fit
RMSEA	< 0.08	0.08 [0.068 – 0.109]	Fit
CFI	>0.9	0.990	Fit
TLI	>0.9	0.986	Fit
SMR	< 0.08	0.055	Fit

Sources: Personal Data (2024).

Based on the factor loadings, the AVE values for employee participants indicate that perceived helplessness has a value of 0.62 and perceived self-efficacy has a value of 0.54, with a total AVE of 0.58. Since all AVE values are above 0.50, this indicates that both perceived helplessness and perceived self-efficacy factors have good convergent validity, and the scale used can be relied upon to measure perceived stress among employees. As for the CR values, perceived helplessness has a value of 0.96, while perceived self-efficacy has a value of 0.82. The total CR of 0.93 indicates that overall, the measured scale or constructs have good internal consistency, and the items can be relied upon to measure perceived stress among employees.

Measurement Invariance

Measurement invariance testing based on occupation (employees and students) for the PSS-10 begins at the configured level. Model fit indices related to the measurement invariance testing of the Indonesian version of the PSS-10 based on occupation (employees and students) can be seen in Tables 8 and 9.

Table 8. Measurement invariance testing of the Indonesian version of PSS-10 based on occupation (employee and students)

	Model Fit Index					
	χ^2	df	RMSEA 90% CI	CFI	TLI	SRMR
Measurement invariance based on occupation M1: Configural	1633.51	90	0.096 [0.082 - 0.110]	0.899	0.866	0.071

Sources: Personal Data (2024).

Overall, the configuration model (M1) of the PSS-10 based on employment status as students and employees shows varied results (Table 8). A CFI value of 0.899, approaching 0.90, and an SRMR value

of 0.071 below 0.08 indicate that the model fits relatively well. However, an RMSEA value of 0.096, higher than 0.08, and a TLI value of 0.866, less than 0.90, indicate that there are some issues with the model fit. Based on the problematic model fit, items with factor loadings < 0.5 were eliminated and then retested in the configural stage.

Table 9. Measurement invariance testing of the Indonesian version of PSS-10 based on occupation (employee and students)

	Model Fit Index					
	χ^2	df	RMSEA 90% CI	CFI	TLI	SRMR
Measurement invariance based on occupation						
M1: Configural	1471.14	72	0.090 [0.074 - 0.106]	0.924	0.895	0.053

Sources: Personal Data (2024).

The results of configural invariance testing after eliminating item number 7 showed a significant improvement in model fit, with good CFI and SRMR values. However, the TLI and RMSEA values still did not fit (Table 9). These results indicate that the factor structure of the PSS-10 may differ between students and employees. This means that the way students and employees respond to PSS-10 items and how these items correlate with each other may vary. Some items in the PSS-10 may be more meaningful for one group than the others.

Discussion

The Perceived Stress Scale (PSS) is a well-known instrument for measuring how individuals perceive their lives' unpredictability, uncontrollability, and overwhelm. The items are designed to gauge how individuals feel these aspects. Based on the results of the EFA, two factors were identified, consisting of six items in Factor 1 (perceived helplessness) and four items in Factor 2 (perceived self-efficacy). This aligns with factor analysis tests conducted by other researchers. Although the naming of these factors varies, including based on negative and positive items (Cohen & Williamson, 1988; Lesage et al., 2012; Mimura & Griffiths, 2008; Remor, 2006), some name negative items as perceived helplessness and positive items as perceived self-efficacy. Additionally, Santiago et al. (2020) named the factor consisting of negative items as perceived stress and positive items as perceived control. In this study, the researcher named positive items as perceived self-efficacy and negative items as perceived helplessness.

For student participants, The Goodness of Fit (GOF) results meet all criteria except for the significance level in the Chi-square test, which does not fit. However, this aspect is sensitive to many participants, so the researcher disregarded it by considering other aspects. Although the convergent validity of some factors is low (AVE values below 0.50), overall internal consistency (CR values) is good, especially for perceived helplessness. The perceived stress construct among students has some items that do not fully reflect the construct. However, overall, this scale is reliable enough to measure perceived stress.

The GOF values for employee participants indicate an overall good fit, despite the Chi-square test suggesting otherwise. This discrepancy is often due to the sensitivity of the Chi-square test to sample size (Umar & Nisa, 2020). Other fit indicators such as RMSEA, CFI, TLI, and SMR show that the model aligns well with the data. Therefore, despite one indicator not meeting the criteria, the model is considered to have a good suitability based on other indicators. AVE and CR values for employees are higher than those for students. Based on the factor loading values, the perceived helplessness factor has an AVE of 0.62, and perceived self-efficacy has an AVE of 0.54, with a total AVE of 0.58. AVE values above 0.50 indicate good convergent validity, making this scale reliable for measuring perceived stress among employees. The CR value for perceived helplessness is 0.96, and for perceived self-efficacy, it is 0.82. With a total CR of 0.93, the measured scale or construct demonstrates good internal consistency, indicating that its items can be relied upon to measure employee perceived stress. This is similar to the results of research conducted by Cohen & Williamson (1988) in America with a value of α = 0.78, Chaaya

et al. (2010) in Arabic language research with a value of α = 0.74, and Ng (2013) in their Chinese language research with a value of α = 0.70. Nevertheless, some studies from Turkey, Spain, and Thailand have reported higher reliability coefficients, with α = 0.82-0.84 (Lesage et al., 2012; Örücü & Demir, 2009; Remor, 2006).

The results of the multigroup CFA analysis of the PSS-10 based on employment status (students and employees) show varying fit indices. A CFI value of 0.899, approaching 0.90, and an SRMR value of 0.071 below 0.08 indicate that the model almost fits well. However, an RMSEA value of 0.096 (higher than 0.08) and a TLI value of 0.866 (less than 0.90) indicate some issues with the model fit. After eliminating items with factor loadings < 0.5 and retesting in the configural stage, the results show a significant improvement in model fit, with good CFI and SRMR values. However, TLI and RMSEA still do not fit well. These findings suggest that the factor structure of the PSS-10 differs between students and employees, implying differences in how both groups respond to and interpret PSS-10 items. PSS-10 items may be perceived as more meaningful for one group than the other.

Conclusion

After conducting internal validity testing on the PSS-10 using the Indonesian language, it was concluded that the GOF values of the PSS-10 for both student and employee participants overall fit the criteria. Although the AVE values for student participants were low, the CR values were satisfactory. Meanwhile, the AVE and CR values were equally good for employee participants. The Multigroup CFA analysis indicated differences in the factor structure of the PSS-10 between students and employees, suggesting variations in how the two groups respond to and interpret PSS-10 items. Some items may be more meaningful for one group compared to the other.

Acknowledgment

Conflict of Interest

The Authors declare that there is no conflict of interest.

Authors Contribution

ARH proposed the research theme, conducted data analysis, and wrote the manuscript. LM was responsible for data collection. CHL was in charge of translating the instrument. CPD reviewed and edited the manuscript.

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Appendix

A. PSS-10 of Indonesian Version

Factors	Number of Items	Items
Perceived helplessness	3	Dalam sebulan terakhir, seberapa sering Anda merasa gelisah dan stres?
	2	Dalam sebulan terakhir, seberapa sering Anda merasa tidak mampu mengendalikan hal-hal penting dalam hidup Anda?
	1	Dalam sebulan terakhir, seberapa sering Anda merasa kecewa karena sesuatu yang terjadi secara tidak terduga?
	10	Dalam sebulan terakhir, seberapa sering Anda merasa tidak mampu menyelesaikan permasalahan-permasalahan yang menumpuk dalam hidup Anda?
	6	Dalam sebulan terakhir, seberapa sering Anda mengetahui bahwa Anda tidak bisa mengatasi hal-hal yang harus Anda lakukan?
	9	Dalam sebulan terakhir, seberapa sering Anda marah karena hal-hal yang terjadi di luar kendali Anda?
Perceived self-efficacy	4	Dalam sebulan terakhir, seberapa sering Anda merasa percaya diri dengan kemampuan Anda untuk menyelesaikan masalah pribadi Anda?
	8	Dalam sebulan terakhir, seberapa sering Anda merasa mampu mengendalikan permasalahan Anda?
	7	Dalam sebulan terakhir, seberapa sering Anda mampu mengendalikan hal-hal yang menjengkelkan dalam hidup Anda?
	5	Dalam sebulan terakhir, seberapa sering Anda merasa segala sesuatu berjalan sesuai keinginan Anda?

Sources: Personal Data (2024).