ORIGINAL ARTICLE

Cross-cultural Adaptation, Validity and Reliability of the Indonesian Version of the Self-care of Hypertension Inventory Scale

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ABSTRACT

Introduction: Hypertension is a chronic condition that allows a person to monitor their health care actively. Since systemic hypertension is a growing problem in Indonesia, we translated and adapted the self-care of Hypertension Inventory (SC-HI) for use in that country's population. This study aims to test the psychometric properties of the SC-HI Indonesian version of its validity and reliability. **Methods:** This was a descriptive cross-sectional study carried out in West Java, Indonesia. A total of 144 hypertensive adults were utilized as a convenience sample to evaluate the inventory's reliability and validity. The SC-HI was translated into Indonesian from English using forward-backward transition, expert panel review, and pilot testing. The factor construct validity was determined using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Convergent validity was determined using linear correlations. The Cronbach alpha coefficient, intraclass correlation coefficient, and item-total correlation coefficient were used to calculate the reliability of SC-HI. **Results:** Factor's loadings of each of the three scales indicating satisfactory construct validity. The Kaiser–Meyer–Olkin (KMO) value was 0.941 and the Bartlett test yielded a significant result (X2 = 2136.32; P<0.001). The Cronbach alpha coefficient of the SC-HI ranged from 0.899 to 0.937, ICC for test-retest reliability was 0.775 to 0.780, and the item-total score correlations for the scale ranged from 0.516 to 0.730. **Conclusion:** The SC-HI has been successfully translated and cross-culturally adapted for the Indonesian people. Health care providers can administer the SC-HI in Indonesia to assess self-care in health care settings.

Keywords: Self-care, Hypertension, Behavior rating scale, Translation, Cross-culture adaptation

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INTRODUCTION

Globally, hypertension is estimated at 26 % of the world's population (972 million people), and the incidence is expected to rise to 29 percent by 2025, mainly driven by economically developing nations. A greater percent of men (47%) have a high blood pressure than women (43%), and only about 1 in 4 adults (24%) with hypertension have their condition under control (1,2). The higher the prevalence of hypertension, it will exert an immense burden on public health (3). This disease involves more men, with 24.1% in men and 20.1% in women of the adult population, and it is a general public health problem worldwide (4). It is estimated that almost 1.5 billion adults worldwide will have hypertension in the decade ahead (5). Japan had the greatest prevalence of hypertension at 60%, followed by Pakistan with 50.3%, Korea with 32.9% in male and 23.7% in women, Hong Kong with 31.6%, Malaysia with 30.9%, and India with 29.8%. Indonesia, by contrast, was eighth, at 26.5% (6). According to the Indonesia Family Life Survey (2018), the prevalence of hypertension among participants was 33.4 per cent (95 per cent CI: 32.7–34.0). In addition, data related to blood pressure measurement (7) showed that the prevalence of hypertension as diagnosed by a physician was decreased from 9.4% in 2013 to 8.4% in 2018. Studies showed 31.0 per cent among males (95 per cent CI: 30.2, 31.9) and 35.4 per cent among females (95 per cent CI: 34.6, 36.3) (7). Approximately 42.9 per cent were aware of hypertensives, 11.5 per cent were treated, and 14.3 per cent were controlled (1,3). Hypertension in persons over

the age of 18 grew from 25.8% in 2013 to 34.1% in 2018, according to the results of the Baseline Health Research in Indonesia 2018. In 2018 (7). Hypertension is a chronic condition that allows a person to monitor their health care actively.

Taking care of oneself is keeping oneself well, keeping a close eye out for any signs of illness, and responding swiftly to any concerns that arise so as to avoid a worsening of the condition (8). It is recommended that patients keep a close eye on their blood pressure readings. While using prescription drugs, it's important to follow any recommended dietary or exercise regimens.. They manage their body mass index (BMI), adopt healthy eating habits, reduce sodium intake in the diet, regular physical activity for at least 30 minutes per day, and moderate alcohol intake (9). Such treatments are based on evidence and have shown a decrease in blood pressure and regulation of hypertension (10,11). Compliance with self-care behaviors like weight control, low salt intake, physical activity, and drug intake was lower in many hypertension patients (12). Negligent self-care has serious consequences for patients with hypertension, such as an increased risk of stroke and heart attack (13) and more frequent hospitalizations (14,15).

Research and clinical experts require an accurate and reliable instrument to measure this behavior if patients with hypertension are going to keep up with their self-care. Currently, most tools only measure isolated aspects of hypertension patients' ability to self-care. An illness-specific instrument for self-care in hypertension was developed in 2016 by a group of American researchers and is called the Self-Care of Hypertension Inventory (SC-HI) (16). The SC-HI was designed on the basis of a theory of self-care in chronic disease (17), and it is a measure of completely autonomous care, including actions taken to control high blood pressure (such as keeping doctor's and nursing appointments) and keeping an eye out for warning signs (such as regular blood pressure checks) (e.g., confidence in following the treatment regimen). We localized the SC-HI for usage in the populace of Indonesia because of the rising prevalence of systemic hypertension there (8). Accordingly, the purpose of this research is to examine the validity and reliability of the SC-HI in its Indonesian iteration.

MATERIALS AND METHODS

Sample and design

West Java, Indonesia served as the location for a descriptive cross-sectional study that took place between June and July of 2021. For this study, we evaluated the inventory's reliability and validity using a convenience sample of 144 hypertensive adults. We used a Google Form online survey tool to directly recruit participants from outpatient clinics at hospitals in Karawang, West Java, Indonesia. Participants had to be between the ages of 35 and 65, have been prescribed two or fewer antihypertensive medications, have a blood pressure reading of more than 140/90 mm Hg at baseline, self-monitor their blood pressure and adjust their medication dosage as needed, and be fluent in written and spoken Bahasa Indonesia.

Instrument

Patient age, sex, educational level, marital hypertension status, and prescription numbers were collected via a closed question in the sociodemographic and clinical survey.

Hypertensive self-care is evaluated in three dimensions (self-care maintenance, self-care management, and self-care confidence) using the SC-HI, a 24-item questionnaire. The self-care maintenance dimension comprises practices suggested to maintain hypotension under complete control, including monitoring blood pressure, exercise, taking proper antihypertensive drugs as prescribed by a doctor, and reducing sodium intake. The self-care management scale has been proven to accurately assess how quickly people discover that their blood pressure is increased, how often they use medication to lower blood pressure (e.g., dealing with stress) and how they would have recognized the effectiveness of their therapy. To measure self-care confidence, patients are asked to respond to six statements about their capability to perform maintenance and self-care strategies (e.g., confidence in control blood pressure). Patients fill out the instrument by marking a frequency of use on a Likert scale ranging from "rarely or never" (1) to "always or daily" (4) for each question, with the exception of "unrecognized" (0) and "very quickly" (4) and "nothing tried" (0) and "very sure" (4), where the Likert scale runs from "uncertain" (0) to "very sure" (4). (4). With a Likert-type scale ranging from "not confident" (1) to "very confident" (5), respondents can express their level of assurance in their ability to provide for their own care (4). Each scale has a possible score between 0 and 100, with higher scores indicating more introspection. If you get 70 or more, that's good enough. Each facet of self-care can now be reduced to a unidimensional factor of self-assurance and uniformity (Alpha=.83) (17).

Hypertension therapy adherence is measured by 14 items on the Hill-Bone High Blood Pressure Therapy Compliance Scale (18). The scale has 14 items with a four-point response format: (4) always, (3) most of the time, (2) sometimes, and (1) never. When the individual scores are added together, the total score ranges from 14 (the lowest) to 56 (the highest). Determining the dietary intake of salty foods by evaluating prescription refills and doctor's visits; the three-item appointment schedule has three questions for refilling medications and appointments. The eight-item medicine schedule measures drug treatment. The sodium scale includes three measurements, each for a different age group.

This survey was self-administered, but it only takes approximately 5 minutes to accomplish.

Translation and cultural adaptation process

The SC-HI was translated into Indonesian for the first time by a nurse specialist in internal diseases (PhD) and a bilingual professional. The translations were examined and formulated. We found no different meanings. This translation was done by a health professional and a linguist who speak both English and Indonesia. The SC-HI was reviewed by an Indonesian language expert, a healthcare researcher and a nursing specialist in internal diseases for its sentence structure, syntactic, and contextual appropriateness. We found no different meanings. After much deliberation, it was concluded that no modifications would be made. Therefore, all 24 items from the quiz were included in finalizing the Indonesian version of the SC-HI self-care maintenance, management, and confidence.

Linguistic adaptation

Pilot testing was performed with 30 non-participants to evaluate comprehensibility. The rate of comprehension was determined (19). The SC-HI had a comprehension rate of 0.0041. This version was deemed relevant, concise, understandable, and simple to fill by patients with hypertension. During a pilot study, patients had no problems comprehending any of the SC-HI items. Linguistic equivalence was thus attained, and the final version was presented to the Indonesian version.

Content validity

Content validity is how suitable the instrument was to measure the concept. Two methods improve content validity: (a) proper conception and domain evaluation just before item creation and (b) assessment of the appropriate information through expert appraisal after the items have been generated (19). The theory behind the notion was used to conceptualize domains and generate items. The second stage was assessed by a panel of experts consisting of five cardiovascular nurse's healthcare professionals and scientific researchers who have been requested to assess the relevance of each item contents on a scale of 1 (irrelevant) to 4 (extremely relevant). Experts were also requested to comment on issues that needed to be revised and absent information (19). The expert panel's suggestions for minor edits were integrated into the scale before we finally started conducting psychometric testing on it. The CVI ranged from 0.80 to 0.93.

Data collection procedure

The surveys were filled out by patients during routine visits to the hospital's outpatient clinics. Scientists administered questionnaires to patients twice to determine test-retest reliability. Included in the initial set of inquiries were the SC-HI as well as the clinical and demographic characteristics questionnaires.

The ethics committee (0119/KEPK/STIKEP/PPNI/JABAR/VIII/2021) and the patients gave their written permission for the study. This research was carried out in light of the Helsinki Declaration.

Data analysis

Descriptive statistics, such as means and standard deviation, were used to analyze the characteristics of the respondents. The factor construct validity was determined using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Each item's factor loading was expected to be greater than 0.40. In the CFA, the CFA test was examined as a "good-of-fit" indices, including chi-square wellness test (X2/df), goodness-of-fit index (GFI), non-standardized NNFI (nonstandard fit index), standardized root averages square residual (SRMR), comparative fit index (CFI). We assumed that at X2/df ≤ 2.0, GFI ≥ 0.90, NNFI ≥ 0.90, CFI ≥ 0.90, SRMR <0.10, and RMSEA ≤ 0.08, suggested acceptable fit, and we calculated the following parameters: Convergent validity was determined using linear correlations (with a significance level of $p<0.05$ as the indicator of convergence). The Cronbach alpha coefficient was used to calculate the internal consistency of the test. The correlation between item-total scores was also used for this purpose. The intraclass correlation coefficient was used to assess the test-retest reliability for evaluating sustainability (ICC). An ICC greater than 0.70 was regarded as satisfactory (20). The item-total correlation coefficient had to be greater than 0.30 to be considered significant (20). Analysis was performed utilizing SPSS, version 20 (SPSS, Inc, Chicago, IL).

RESULTS

Characteristics of patients

55 patients out of 200 invited declined to participate in this study. Therefore, the total number of participants in the current study was 144 people. The test-retest reliability was evaluated by subdividing the sample (n = 144) into two groups and having one group repeat the scale two weeks later. The typical patient was 55.6710.65 years old, a woman (59.7%), was married (77.8%), and had completed secondary school (48.6%). In this sample, hypertension persisted for a mean of 7.38 3.55 years. Patients typically took 3.111.54 antihypertensive medicines. (Table I).

Construct validity

Table II displays factors loadings of each of the three scales in the SC-HI (0.40–3.20), indicating satisfactory construct validity. The Kaiser–Meyer–Olkin (KMO) value was 0.941, suggesting that the representative sample was appropriate for the study. The Bartlett test yielded a significant result ($X^2 = 2136.32$; $P<0.001$), suggesting that factor analysis was essential. The SC-HI – maintenance scale was found to have a single factor with an eigenvalue >1 that explained

Table II : Factor loading of individual items in the self-care maintenance, management and confidence hypertension inventory with exploratory factor analysis.

	Factor loading	Eigen Value	Variance explained (%)
Self-Care Maintenance Items		**4.54**	**40.76**
1. Check your BP	0.76		
2. Eat lots of fruits and vegetables	0.88		
3. Do some physical activity	0.65		
4. Keep doctor or nurse appointments	0.66		
5. Eat a low salt diet	0.58		
6. Exercise for 30 minutes	0.76		
7. Take medicines as prescribed	0.83		
8. Ask for low salt items when eating out or visiting others	0.65		
9. Use a system to help you remember your medicines? For example, use a pill box or reminders.	0.66		
10. Cut down on the alcohol you drink (If you never drink, circle 4 for always)	0.47		
11. Eat a low-fat diet	0.51		
12. Try to lose weight or control your body weight	0.43		
Self-Care Management items		**6.74**	**43.73**
13. How quickly did you recognize that your blood pressure was up	0.63		
14. Reduce the salt in your diet	0.81		
15. Reduce your stress level	0.65		
16. Be careful to take your prescription medicines more regularly	0.79		
17. Call your doctor/ nurse for guidance	0.88		
18. How sure were you that the action helped or did not help	0.57		
Self-Care Confidence Items		**5.67**	**38.66**
19. Control your BP	0.61		
20. Follow your treatment regimen	0.58		
21. Recognize changes in your health	0.79		
22. Evaluate changes in your BP	0.64		
23. Take action that will control your BP	0.59		
24. Evaluate how well an action works	0.60		

Table I : Sociodemographic characteristics of the sample (N = 144).

Variables	
Age, years	55.67 ± 10.65
Female	88 (59.7%)
Married	112 (77.8%)
Education Attainment	
Primary school	46 (31.9%)
Secondary school	70 (48.6%)
Higher than secondary school	28 (19.4%)
Duration of Hypertension, years	7.38 ± 3.55
Antihypertensive medication	3.11 ± 1.54

Table III : Confirmatory factors analysis of SC-HI scale (N = 144).

Scale	X^2	X^2/df	RMSEA	SRMR	CFI	NNFI	GFI
Self-care Maintenance	38.865	1.974	0.072	0.065	0.921	0.925	0.926
Self-care management	35.371	1.895	0.068	0.065	0.916	0.917	0.945
Self-care confidence	36.422	1.967	0.071	0.064	0.914	0.914	0.923

Table IV : Linear Correlations Between Self-care of Hypertension Inventory Domains and Hill-Bone High Blood Pressure Therapy Compliance Scale

Scale	Reduced sodium intake	Appointment keeping	Medication taking
Self-care Maintenance	0.547; P<0.001	0.679; P<0.001	0.499; P<0.001
Self-care management	0.513; P<0.001	0.608; P<0.001	0.538; P<0.001
Self-care confidence	0.604; P<0.001	0.582; P<0.001	0.625; P<0.001

Table V : Reliability of SC-HI scale.

Scale	Cronbach's Item-total correlation (n = 144)	Item-total correlation (Range) (n = 144)	Intraclass correlation coefficient (n = 72)
Self-care Maintenance	0.899	0.456—0.687	0.775
Self-care management	0.925	0.533—0.728	0.765
Self-care confidence	0.901	0.516—0.730	0.780

40.76 per cent of the total variance using factor analysis. The loadings of items on factors were found to be between 0.43 and 0.88. (Table II).

Factor analysis showed that the sample size was appropriate based on the results of exploratory factor analysis for the SC-HI – management scale, which returned a KMO value of 0.916. The Bartlett test (X^2=1532.45, P<0.001) was significant and indicated an adequate analysis of the factor. The SC-HI – management scale was found to have a single factor with an eigenvalue >1 that explained 38.66 per cent of the total variance using factor analysis. The loadings of items on factors were found to be between 0.58 and 0.79. (Table II).

Factor analysis results indicated that the sample size was suitable for factor analysis, as the value of KMO was 0.947. The Bartlett test showed a statistically significant (X^2 = 1765.56, P<0.001) result, thus supporting the need for factor analysis. Primary component analyses revealed the extraction of a single factor with its own value>1, which explained 48,08 per cent of the total variance. The loadings of items on factors were found to be between 0.569 and 0.765. (Table II).

The confirmatory factor analysis results are shown in Table III, which shows the findings for each of the three scales of the SC-HI. The model was acceptable and appropriate when confirmatory factor analyses of the maintenance, management, and confidence scale were conducted.

Convergent validity

The linear relationships between the self-care of hypertension inventory domains and the hill-bone high blood pressure therapy compliance scale are shown in Table IV. The domains of maintenance, management, and confidence were related to each other on the hill-bone high blood pressure therapy compliance scale.

Reliability analysis

The SC-HI - maintenance scale had a Cronbach alpha of 0.899 and an ICC of 0.775 for test-retest consistency. We calculated item-total scale correlations, and they ranged from 0.456 to 0.687. (Table I). Two weeks after the initial test-test, the SC-HI-management scale had an ICC of 0.76 and a Cronbach's alpha of 0.93. There was a moderate to large range (0.533-0.728) in the correlations between the items and the overall scores. (Table I). The SC-self-assurance HI's subscale had a Cronbach alpha of 0.901 and an intraclass correlation coefficient of 0.780, suggesting high levels of reliability. For this scale, the correlations between individual items and the final score fell in the range of 0.516 to 0.730. (Table I).

DISCUSSION

This research aimed to evaluate the accuracy and precision of the translated SC-HI into Indonesian. This study's results show that the Indonesian version of the SC-HI is a valid and reliable tool for gauging patients' efforts to manage their hypertension on their own. All three subscales of the Indonesian SC-HI exhibited high levels of internal consistency in this investigation, making it a credible instrument for use in clinical and research contexts. The most important results of the SC-HI in hypertension patients were consistent across all language versions of the SC-HI (8,12,21,22). Clinical practice evaluation of self-care behaviour is crucial. However, it seems complicated due to patients' reports of self-care behaviour being the only strategy of obtaining information in regularly scheduled clinical practice. In contrast, precision and agreement with the other information sources are controversial, which requires validity investigation.

he SC-HI was first tested by (16) It has been reported that the measurement was reliable and correlated with blood pressure control in low-income hypertensive patients. However, the low-income patients in our study make up a significant portion of our hypertensive patient population. Even though their answers cannot be related to a lack of comprehension of the questions due to retest reliability, they are likely correct. It may be more profitable for clinical purposes to discover patients with poor self-care behaviour (high or low blood pressure control) rather than having good self-care with controlled blood pressure. Additionally, given the possibility of a high proportion of false-poor self-care resulting from low specificity, attempts to enhance self-care are typically not accompanied by costly or risky measures.

The results of the canonical factor analysis (CFA) of the self-care maintenance, management, and confidence scale corroborated the original findings. We speculate that the people of Indonesia have the worst time regulating these three habits. People in this group avoid going on walks and do not like eating at restaurants. Through psychometric testing, it was established that there was just one dimension to the self-care assurance scale. In terms of the factor score determinacy coefficient, all three rating scales were judged to be credible. With few items and few dimensions, Cronbach's alpha may not be the best measure of reliability (23–25). Inter-observer analysis and test-retest reliability were performed to ensure substantial agreement in the results during the cross-cultural adaption of this scale (8).

Limitations

There were some limitations to this study. First, some psychometric properties, such as discriminant validity, were not investigated. Second, because the sample

was drawn from only one institution, the generalizability of our findings may be limited. In addition, most patients were educated at a low level.

CONCLUSION

The SC-HI has been successfully translated and cross-culturally adapted for the Indonesian people. The SC-HI could be useful for estimating how this treatment will affect patients' ability to take care of themselves. The SC-HI can be administered in Indonesian by medical professionals to evaluate patients' ability to care for themselves in a variety of contexts. It is recommended that the SC-HI be tested in larger, more representative samples of hypertension patients from a variety of ethnic backgrounds and educational backgrounds. Additionally, structural equation modeling should be used to assess the SC-HI in future investigations.

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