



VALIDITY AND RELIABILITY OF THE INDONESIAN VERSION OF THE HYPERTENSION SELF-CARE QUESTIONNAIRE (HSCQ) AMONG PATIENTS WITH HYPERTENSION

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ABSTRACT

In order to effectively control hypertension over the long term, self-care is essential. Therefore, evaluating self-care practices among Indonesian individuals with hypertension requires a tool that is both culturally and linguistically acceptable. The aim of this study was to assess the validity and reliability of the Hypertension Self-Care Questionnaire (HSCQ) in Indonesian. The HSCQ was adapted through a systematic translation and cross-cultural adaptation process involving forward translation, synthesis, back translation, expert review, pretesting, and psychometric evaluation. A total of 160 adult patients with hypertension participated in the psychometric evaluation. Construct validity was assessed using confirmatory factor analysis (CFA) with AMOS, while internal consistency was examined using Cronbach's alpha and corrected item-total correlation (CITC). The 16-item Indonesian HSCQ demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.862. CITC values ranged from 0.321 to 0.657, with all items exceeding the predefined criterion of 0.30. Standardized factor loadings ranged from 0.625 to 0.823. The CFA demonstrated a good-fitting model ($\chi^2 = 116.083$, $df = 94$, $p = 0.061$, $CMIN/DF = 1.235$, $RMSEA = 0.038$, $GFI = 0.918$, $CFI = 0.979$, and $TLI = 0.973$). No negative residual variances or standardized factor loadings exceeding 1.00 were identified in the model. The Indonesian version of the HSCQ demonstrated acceptable construct validity and internal consistency, supporting its potential use for assessing hypertension self-care among Indonesian adults with hypertension.

Keywords: hypertension; questionnaire; reliability; validity; self-care

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INTRODUCTION

Hypertension remains a major a worldwide public health issue and a significant risk element for cardiovascular diseases and other long-term complications. Because blood pressure control depends not only on pharmacological therapy but also on daily self-care behaviors, such as medication adherence, healthy lifestyle, frequent monitoring, and proper follow-up, effective hypertension management necessitates active patient engagement (Konlan, 2023; Mccarthy et al., 2024; Organization, 2025; Unger et al., 2020). Hypertension self-care encompasses multiple behaviours, such as adherence to prescribed medication, healthy dietary practices, physical activity, weight management, blood pressure monitoring, and engagement with health-care services. However, self-care practices among people with hypertension remain suboptimal, particularly in relation to physical activity, dietary practices, weight control, and medication adherence. These behaviours may also be influenced by individual, cultural, and environmental factors (Alkubati et al., 2023; Irwan et al., 2022). Therefore, systematic assessment of hypertension self-care is important to identify patients' needs and support appropriate nursing interventions (Azmiardi et al., 2023; Sarfika, 2025).

The Hypertension Self-Care Questionnaire (HSCQ) was specifically developed to assess hypertension self-care and consists of 16 items across five dimensions: Follow Up, Healthy Lifestyle, Promoting Qualification, Medication Therapy, and Following Recommendation (Eghbali-

Babadi et al., 2019). However, an instrument developed in one linguistic and cultural context cannot necessarily be applied directly to another population. Cross-cultural adaptation is therefore necessary to maintain semantic, conceptual, and cultural equivalence. Beaton et al. (2000) recommend a systematic process comprising forward translation, synthesis, back translation, expert committee review, and pretesting before psychometric evaluation. The need for systematic adaptation is particularly relevant for hypertension self-care instruments because health behaviours may be influenced by cultural and contextual characteristics. Additionally, recent research has shown how crucial structured translation and psychometric assessment are when modifying hypertension-related tools for various communities (Naddafi et al., 2025). Although several hypertension self-care instruments have been evaluated in Indonesian populations, these instruments are not interchangeable because they differ in conceptual frameworks, dimensions, and item structures. Thus, the validity and reliability of an Indonesian version should be established specifically for the HSCQ. Evidence regarding the Indonesian adaptation of the 16-item HSCQ comprising five dimensions remains limited. Therefore, The purpose of this study was to translate, culturally modify, and assess the psychometric qualities of the HSCQ in Indonesian among hypertension patients. In order to ascertain if the modified instrument offers a valid and trustworthy measure of hypertension self-care in the Indonesian context, the study specifically evaluated its content validity, internal consistency, and construct validity.

METHOD

This methodological study was conducted to translate, culturally adapt, and evaluate the psychometric properties of the Indonesian version of the Hypertension Self-Care Questionnaire (HSCQ). The study was conducted at RSUD Dr. Moewardi, Surakarta, Indonesia, from March to June. The cross-cultural adaptation process was guided by the recommendations of Beaton et al. (2000), followed by content validity assessment and psychometric evaluation of the adapted instrument. The instrument adapted in this study was the Hypertension Self-Care Questionnaire (HSCQ) developed by Eghbali-Babadi et al. (2019). original HSCQ consists of 16 items distributed across five dimensions: Follow Up, Healthy Lifestyle, Promoting Qualification, Medication Therapy, and Following Recommendation. The Indonesian version was developed through a systematic translation and cross-cultural adaptation process to maintain the semantic and conceptual equivalence process to maintain semantic, conceptual, and cultural equivalence of the original instrument (Beaton et al., 2000; Cruchinho et al., 2024; Zhao, 2024)

Forward translation, translation synthesis, back translation, and expert committee evaluation comprised the translation and cross-cultural adaptation process, which adhered to Beaton et al. (2000)'s guidelines. The original English version of the HSCQ was independently translated into Bahasa Indonesia by two translators who were proficient in English and Bahasa Indonesia. Two independent Indonesian versions were produced to identify differences in wording and interpretation. Through debate and consensus, the two forward translations were compared and combined into a single Indonesian version. To guaranty conceptual equivalence with the original instrument and clarity for the target population, variations in vocabulary, language, and interpretation were examined. The synthesized Indonesian version was independently back-translated into English by two translators who were not involved in the forward translation process. The back-translated versions were compared with the original HSCQ to identify discrepancies in meaning and interpretation. The translated version was reviewed by an expert committee consisting of five experts: two medical doctors, two nursing lecturers, and one nurse. The experts assessed each item's suitability, relevance, and clarity in relation to the Indonesian cultural context and the concept of hypertension self-care. Recommendations from the experts were considered in refining the Indonesian version before psychometric evaluation.

Participants and Data Collection

A total of 160 patients with hypertension were included in the psychometric evaluation. The sample size was determined using a participant-to-item ratio of 10:1 for the 16-item HSCQ, resulting in 160

participants. This ratio falls within the range of participant-to-item ratios reported in factor-analytic studies (Goretzko et al., 2024). Participants have to be at least eighteen years old to participate, had received hypertension treatment for at least six months, could read and understand Bahasa Indonesia, and provided written informed consent. Patients with cognitive or hearing impairment, acute medical conditions that could interfere with questionnaire completion, or incomplete questionnaires were excluded. Data were collected using the Indonesian HSCQ and a demographic form. Sociodemographic and clinical variables included sex, age, educational attainment, and duration of hypertension. The questionnaire was completed by participants during the study period under the researchers' supervision. A panel of five experts was involved in assessing the content validity, including two physicians, two nursing professors, and one nurse. The relevance of each questionnaire item was rated on a four-point scale. Content validity was quantified using the item-level content validity index (I-CVI) and the scale-level content validity index calculated by the average method (S-CVI/Ave). Values of I-CVI ≥ 0.78 and S-CVI/Ave ≥ 0.90 indicated satisfactory content validity. (Polit & Beck, 2021).

CFA was used to assess construct validity and determine if the results supported the proposed five-factor structure of the Indonesian HSCQ. IBM SPSS AMOS version 22 was used to conduct CFA. The hypothesized model consisted of five dimensions: Follow Up, Healthy Lifestyle, Promoting Qualification, Medication Therapy, and Following Recommendation. Model fit was assessed using χ^2 , CMIN/DF, RMSEA, GFI, CFI, and TLI. Based on COSMIN criteria, CFI or TLI > 0.95 or RMSEA < 0.06 indicated good model fit (Prinsen et al., 2018). Additional fit criteria were considered, with CMIN/DF ≤ 3.00 and GFI ≥ 0.90 interpreted as indicative of acceptable model fit. Standardized factor loadings were also examined to assess the contribution of each observed item to its respective latent construct. Potential improper solutions, particularly standardized factor loadings > 1.00 and negative residual variances, were examined to identify potential Heywood cases

The internal consistency of the instrument was evaluated using Cronbach's alpha coefficient. According to COSMIN guidelines, a Cronbach's alpha of ≥ 0.70 was considered acceptable for internal consistency when sufficient structural validity had been demonstrated. Item discrimination was assessed using the corrected item-total correlation (CITC). A CITC value of ≥ 0.30 was considered acceptable. An item may require more investigation if its correlation with the entire construct is less than 0.30 (Stefana et al., 2025). The reliability analysis was carried out using IBM SPSS Statistics version 20.

Data analysis was performed using IBM SPSS AMOS version 22 and IBM SPSS Statistics version 20. Descriptive statistics were used to summarize the participants' characteristics. Content validity was determined using the item-level content validity index (I-CVI) (Polit et al., 2007; Prinsen et al., 2018). Internal consistency was assessed using Cronbach's alpha, while the corrected item-total correlation (CITC) was used to evaluate the relationship between individual items and the total scale score (Mokkink et al., 2024; Stefana et al., 2025). The proposed five-factor structure of the Indonesian HSCQ was evaluated using confirmatory factor analysis (CFA) with AMOS. Model fit was assessed using the chi-square statistic (χ^2), chi-square/degree of freedom (χ^2/df), RMSEA, AGFI, CFI, TLI, and IFI, with interpretation based on established recommendations for evaluating measurement models (Goretzko et al., 2024; Mokkink et al., 2024). The Komisi Etik Penelitian Kesehatan RSUD Dr. Moewardi granted ethical approval under approval number 2.695/XII/HREC/2025. Prior to participation, each participant was told about the goals and methods of the study and gave their informed permission. Participants' information was kept private and confidential throughout the study, and participation was entirely voluntary.

RESULT

Characteristic Response

A total of 160 patients with hypertension participated in the study. Their sociodemographic and clinical characteristics are presented in Table 1.

Table 1.
Sociodemographic and Clinical Characteristics of Participants (n = 160)

	Respondent Characteristics	f	%
Gender	Male	79	49,7
	Female	81	50,3
Age	20–29 yo	9	5,7
	30–39 yo	30	18,9
	40–49 yo	40	25,2
	50–59 yo	41	25,2
	60–69 yo	28	17,6
	≥70 yo	12	7,5
Level of education	Elementary School	2	0,6
	Junior High School	8	5,0
	Senior High School	106	66,7
	Diploma/Bachelor	44	27,7
Duration of hypertension	1–3 yo	31	19,5
	4–8 yo	93	58,5
	≥9 yo	36	22,0

The participants included both male and female adults across different age groups, educational levels, and durations of hypertension.

Content validity

Five experts, comprising two physicians, two nursing academics, and one nurse, evaluated the content validity of the Indonesian HSCQ. The I-CVI values ranged from 0.80 to 1.00. Items 1, 3, 6, and 9 obtained an I-CVI of 0.80, indicating agreement from four of the five experts, whereas the remaining 12 items achieved an I-CVI of 1.00. The S-CVI/Ave was 0.937, exceeding the commonly recommended criterion of 0.90 for satisfactory scale-level content validity (Polit et al., 2007). 16 items were kept for a later psychometric assessment after professional review.

Internal consistency

The item analysis and internal consistency results are presented in Table 2. CITC values ranged from 0.321 to 0.657, and Cronbach's alpha for the 16-item scale was 0.862. Alpha values if individual items were deleted ranged from 0.846 to 0.862.

Table 2.
Item Analysis and Internal Consistency of the Indonesian HSCQ

Item	CITC	Alpha if Item Deleted
Sc1	0.321	0.862
Sc2	0.455	0.856
Sc3	0.322	0.862
Sc4	0.657	0.846
Sc5	0.624	0.847
Sc6	0.489	0.854
Sc7	0.547	0.852
Sc8	0.613	0.848
Sc9	0.542	0.852
Sc10	0.615	0.848
Sc11	0.510	0.853
Sc12	0.576	0.850
Sc13	0.398	0.859
Sc14	0.372	0.860
Sc15	0.415	0.857
Sc16	0.403	0.858
Overall Cronbach's α	0.862	16 items

All 16 items met the predefined CITC criterion of 0.30

Construct Validity and Confirmatory Factor Analysis

The CFA results are presented in Figure 1, Table 3, and Table 4. The hypothesized five-dimensional structure of the HSCQ was retained, comprising Follow-Up, Healthy Lifestyle, Promoting Qualification, Medication Therapy, and Following Recommendation.

Table 3.
Goodness-of-Fit Indices of the CFA Model

Fit Index	Obtained Value	Assessment
X ²	116.083	Good
DF	94	—
X ² /DF	1.235	Good
P-VALUE	0.061	Good
RMSEA	0.038	Good
AGFI	0.918	Acceptable
CFI	0.979	Good
TLI	0.973	Good
IFI	0.979	GOOD

Table 4.
Standardized Factor Loadings of the Indonesian HSCQ

Dimension	Item	Standardized loading
Follow-Up	Sc1	0.625
	Sc2	0.816
	Sc3	0.635
Healthy Lifestyle	Sc4	0.769
	Sc5	0.809
	Sc6	0.773
	Sc7	0.784
	Sc8	0.753
Promoting Qualification	Sc9	0.791
	Sc10	0.798
	Sc11	0.789
	Sc12	0.725
Medication Therapy	Sc13	0.823
	Sc14	0.809
Following Recommendation	Sc15	0.812
	Sc16	0.786

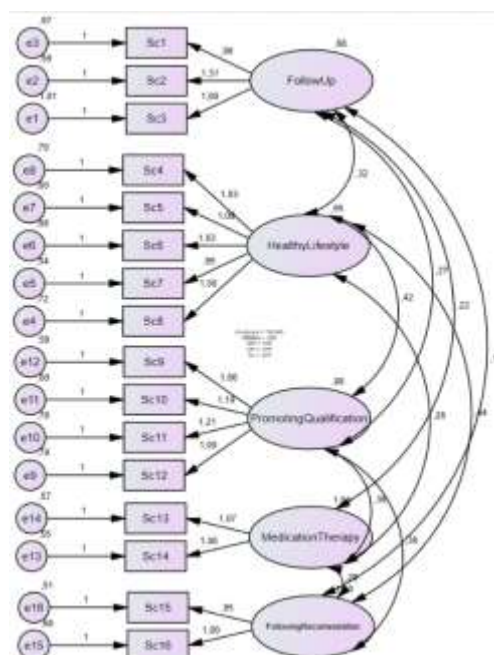


Figure 1. CFA model of the Indonesian version of Hypertension Self-Care Questionnaire (HSCQ).

DISCUSSION

This study evaluated the content validity, internal consistency, and construct validity of the Indonesian version of the 16-item Hypertension Self-Care Questionnaire (HSCQ) among 160 patients with hypertension. The participants included adults with different demographic and clinical characteristics, including variations in sex, age, educational attainment, and duration of hypertension. Such variation is relevant in the evaluation of hypertension self-care because self-care is a multidimensional process influenced by patients' knowledge, beliefs, motivation, health experiences, and interaction with healthcare services. Hypertension self-care encompasses several behaviours, including medication adherence, healthy lifestyle practices, blood pressure monitoring, follow-up, and adherence to healthcare recommendations (Cruchinho et al., 2024; Irwan et al., 2022; Naddafi et al., 2025).

The content validity assessment demonstrated good agreement among the five experts involved in evaluating the Indonesian HSCQ. The I-CVI values ranged from 0.80 to 1.00, while the S-CVI/Ave was 0.9375. The high S-CVI/Ave indicates that the overall content of the instrument was considered relevant and appropriate by the expert panel. Although Items 1, 3, 6, and 9 obtained an I-CVI of 0.80, these items were retained because they remained conceptually relevant to the construct being measured and were subsequently evaluated through further psychometric testing. The findings indicate that the adapted items maintained adequate content relevance for assessing hypertension self-care in the Indonesian context (Naddafi et al., 2025; Polit et al., 2007; Prinsen et al., 2018).

The content validity findings are particularly important because cross-cultural adaptation requires more than direct linguistic translation. Differences in language, culture, and healthcare practices may influence how respondents interpret questionnaire items. Therefore, adaptation should consider semantic, idiomatic, experiential, and conceptual equivalence before an instrument is applied to a new population (Beaton et al., 2000; Prinsen et al., 2018). Previous hypertension self-care instrument studies have also demonstrated the importance of translation, cultural adaptation, expert review, and subsequent psychometric testing when instruments are introduced into different linguistic and cultural settings (Naddafi et al., 2025; Shabani et al., 2023).

The Indonesian HSCQ demonstrated good internal consistency, with an overall Cronbach's alpha of 0.862. The CITC values ranged from 0.321 to 0.657. Cronbach's alpha values of ≥ 0.70 are generally considered indicative of acceptable internal consistency, while corrected item-total correlation values of ≥ 0.30 indicate an adequate relationship between individual items and the overall scale (Hair, 2019; Stefana et al., 2025). Indicating that all items demonstrated an acceptable relationship with the overall scale. In addition, deletion of individual items did not meaningfully improve the overall reliability coefficient. These findings support the retention of all 16 items and indicate that the items functioned coherently in measuring hypertension self-care. Comparable psychometric studies of hypertension self-care instruments have also reported satisfactory internal consistency after translation and adaptation to different populations (Eghbali-Babadi et al., 2019; Shabani et al., 2023).

The retention of all 16 items is particularly relevant because the Indonesian HSCQ maintained the item composition of the original instrument. The original HSCQ consisted of 16 items covering five dimensions: Follow Up, Healthy Lifestyle, Promoting Qualification, Medication Therapy, and Following Recommendation. The present findings indicate that these items remained sufficiently related to the overall construct after translation and cultural adaptation into Bahasa Indonesia. This finding supports the conceptual preservation of the original HSCQ structure in the Indonesian context (Eghbali-Babadi et al., 2019; Irwan et al., 2022).

The CFA supported the proposed five-dimensional structure, with all items demonstrating adequate standardized factor loadings. The model also demonstrated an overall satisfactory fit across the examined indices. The combination of adequate factor loadings and favorable model fit indicates that the observed items appropriately represent their respective latent dimensions. Indicating satisfactory structural validity (Mokkink et al., 2024).

The preservation of the five-factor structure is important because hypertension self-care involves several interconnected behaviours rather than a single activity. The dimensions assessed by the HSCQ therefore provide a broader representation of self-care, allowing different aspects of patient behaviour to be identified. This multidimensional approach is consistent with the conceptualization of hypertension self-care in previous instrument-development studies, although different instruments operationalize the construct through different domains and theoretical frameworks (Eghbali-Babadi et al., 2019; Naddafi et al., 2025; Upoyo et al., 2021). Consequently, the five-dimensional structure of the HSCQ should be interpreted as specific to its conceptual framework rather than as the only possible representation of hypertension self-care.

The CFA findings also support the importance of conducting psychometric evaluation after cross-cultural adaptation. Although an instrument may have demonstrated validity in its original setting, differences in language, culture, and health-care. Practices can affect how a new population interprets certain goods. Therefore, evidence from the Indonesian population is necessary before the adapted HSCQ can be confidently used in research and clinical assessment (Beaton et al., 2000)

Prior research conducted by Eghbali-Babadi et al. (2019) demonstrated that the Hypertension Self-Care Questionnaire (HSCQ) consists of 16 items distributed across five dimensions, namely Follow Up, Healthy Lifestyle, Promoting Qualifications, Medication Therapy, and Following Recommendations. In alignment with these findings, the present study retained all 16 items and the same five-dimensional structure following translation and cultural adaptation into Bahasa Indonesia. The evaluation of content validity by five experts demonstrated high agreement, with I-CVI values ranging from 0.80 to 1.00 and an S-CVI/Ave of 0.9375, indicating that the items were considered relevant and appropriate for measuring hypertension self-care in Indonesian patients. Although four items obtained an I-CVI of 0.80, all items were retained because they met the predetermined criterion and subsequently demonstrated acceptable psychometric performance. This finding supports the preservation of the conceptual meaning of the original HSCQ following cross-cultural adaptation (Eghbali-Babadi et al., 2019; Prinsen et al., 2018)

The CITC values ranged from 0.321 to 0.657, indicating that all items had an adequate relationship with the overall scale. The CFA further supported the five-dimensional structure, with $\chi^2 = 116.083$, $df = 94$, $p = 0.061$, $CMIN/DF = 1.235$, $RMSEA = 0.038$, $GFI = 0.918$, $CFI = 0.979$, and $TLI = 0.973$. These results indicate satisfactory model fit and support the structural validity of the Indonesian HSCQ. The factor loadings from 0.625 to 0.823, with all items demonstrating adequate contributions to their respective dimensions. Compared with the original HSCQ, which reported $CFI = 0.90$, $RMSEA = 0.068$, and factor loadings ranging from 0.577 to 0.869, the present findings demonstrate comparable preservation of the factor structure with favorable model fit (Eghbali-Babadi et al., 2019). The difference in fit indices may be influenced by variations in sample characteristics, cultural context, and study setting; therefore, the findings should not be interpreted as indicating that one version is superior to the other. The absence of factor loadings greater than 1.00 and negative residual variances also indicates that no Heywood case occurred, supporting the admissibility and interpretability of the CFA model (Prinsen et al., 2018).

Overall, the findings indicate that the Indonesian HSCQ demonstrated satisfactory content validity, internal consistency, item discrimination, and construct validity, while maintaining the original 16-item and five-dimensional structure. The consistency between the present findings and those of Eghbali-Babadi et al. (2019) suggests that the underlying dimensions of hypertension self-care were maintained after adaptation to the Indonesian context. The multidimensional structure of the HSCQ may provide practical benefits for nursing practice because it enables healthcare professionals to identify specific areas of self-care that require further intervention, such as medication therapy, healthy lifestyle, follow-up, or adherence to healthcare recommendations. Therefore, the Indonesian HSCQ has potential for use in clinical and research settings to assess hypertension self-care; however, further confirmation using larger and more diverse Indonesian populations is recommended to confirm the stability and generalizability of its measurement properties (Prinsen et al., 2018).

Implications for Nursing Practice

The findings indicate that the Indonesian HSCQ provides a standardized approach for assessing multiple dimensions of hypertension self-care. Its multidimensional structure may help nurses identify specific areas of self-care that require further assessment or intervention rather than relying solely on overall self-care scores (Irwan & Potempa, 2022; Konlan, 2023). In clinical practice, the instrument may support individualized nursing education and follow-up by identifying patients who require greater support with medication therapy, healthy lifestyle behaviours, follow-up, or adherence to treatment recommendations. In research, the instrument may also be useful for evaluating interventions designed to improve hypertension self-care among Indonesian patients (Widyastuti et al., 2025). Overall, the results provide preliminary evidence for the use of the 16-item Indonesian HSCQ among individuals with hypertension in Indonesia and support its validity and reliability. To determine whether these results can be applied to other Indonesian populations and healthcare environments, more research would be beneficial.

CONCLUSION

The Indonesian version of the HSCQ demonstrated acceptable construct validity and internal consistency, supporting its potential use for assessing hypertension self-care among Indonesian adults with hypertension.

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