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The Indonesian Version of the Skills, Confidence, and Preparedness Index (SCPI) was tested for reliability and validity in type 2 diabetes patients

Anih Kurnia[1,2], Farida Mohd Said[3], Santhna Letchmi Paduragan[3]

[1] Diploma Nursing study program, Faculty of Health Science, Bakti Tunas Husada University, Tasikmalaya, West Java, Indonesia
[2] Student Doctoral Program Study, Faculty of Nursing, Lincoln University College, Kelana Jaya, 47301 Petaling Jaya, Selangor D.E, Malaysia
[3] Department of Medical Health, Doctoral Program Study, Faculty of Nursing, Lincoln University College, Kelana Jaya, 47301 Petaling Jaya, Selangor D.E, Malaysia

Abstract

Although several diabetes self-care management tools have been created, very few provide preparation for diabetes self-care behavior management. Three essential components of diabetes self-care management are measured by the assessment tool "Skills, Confidence & Preparedness Index (LMC) (SCPI)": Knowledge of skills, Confidence in one's ability to use skills, and Readiness to put skills into practice. This study aims to validate, translate, and adapt the SCPI for usage with Indonesian adults with type 2 diabetes. Methods: The American Academy of Orthopedic Surgeons Evidence Based Medicine Committee (AAOS) criteria for modifying the scale were adhered to in this study. Evaluate average variance, Cronbach alpha, and composite reliability to test validity and reliability. Specifically, determinant coefficient testing and model appropriateness testing are used to assess goodness of fit. Examine the valid R-squared statistical value for every relationship to determine the test. If the p-value is less than 0.05, then there is a direct and indirect association to be seen if the variable is significant Result: Cronbach's alpha > 0.60 indicates strong internal consistency for the Indonesian SCPI version or I-SCPI. For every variable, the AVE value is larger than 0.50, while the CR value exceeds 0.70. This indicates that all legitimate indicators converge to form the variables for which they are intended. The R-Square values of 0.312 and 0.536 for the variables of preparedness and confidence are used to calculate the degree of good fit. This number indicates that the Preparedness variable is only partially explained by the Confidence and Preparedness variables (5.36%), with other variables accounting for the remaining 94.64%. Furthermore, the Skill/Knowledge, Confidence, and Preparedness factors account for only 3% of the variance in

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the Confidence variable, with the remaining 97% explained by variables outside the model. Conclusion: We developed an Indonesian version of SCPI through cross-cultural translation and adaption. The I-SCPI is reliable and valid for assessing the level of self-management in type 2 diabetes patients in Indonesia.

Keywords: Translation, Validity And Reliability, Diabetes, Self-Care Management, Assessment Instruments, SCPI

Corresponding Author: Anih Kurnia
Email: anihkurnia@universitas-bth.ac.id

1. Introduction

A non-communicable condition called diabetes mellitus is spreading like wildfire over the globe. According to the International Diabetes Federation (IDF), the 10th edition of their latest global diabetes atlas reveals a sharp rise in the prevalence of the disease, with an average global growth of 68% to 152 million in 2045. Indonesia has the fifth-highest number of diabetes patients worldwide, behind China, India, Pakistan, and the United States of America (International Diabetes Federation, 2021).

The most fundamental aspect of diabetes treatment is self-care, which involves patients actively enhancing clinical results, quality of life, and regular self-care management (adherence to medication, food, physical exercise, and Foot Treatment) (Agidew et al., 2021; Riegel et al., 2021).

Data collecting indicators (at least 12–24 months) have been selected by IDF to track the efficacy of diabetes management, including self-care. The elements of self-care include one's status as a smoker, use of alcohol, self-monitoring of blood pressure, body weight, and glucose, physical activity, food, and adherence to prescriptions (including insulin administration) (International Diabetes Federation, 2021). Similarly, as a framework for offering patient-oriented diabetes management and knowledge, the American Association of Diabetes Educators (AADE7) has offered seven self-care

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behaviors: eating healthily, staying active, monitoring, taking medicine, problem-solving, healthy coping, and risk reduction (American Association Diabetes and Edukator, 2020).

Maintaining a healthy metabolism and avoiding long-term issues require strict adherence to self-care practices (International Diabetes Federation, 2021; Modarresi et al, 2020). Healthy behavior can lower complications and death in type 2 diabetes patients; nevertheless, Asian individuals are less likely to practice self-care (Paudel et al., 2022). In Indonesia, self-care encompasses more than only taking care of oneself by following doctor's orders, practicing traditional medicine, and utilizing various techniques (such as foot care, information/care seeking, prayer, dieting, resting, and simplifying life). While religion can serve as a source of inspiration to take care of oneself or as a tool for maintaining health (such as prayer), it can also occasionally breed a fatalistic mindset. The knowledge of the illness and its treatment, shaped by beliefs, values, emotions, health literacy, and socioeconomic status, affects the type of treatment sought, whether conventional. In addition, the family plays a significant part in offering assistance (Lukman et al., 2020).

A distinct obstacle to achieving ideal diabetic self-management is the amalgamation of various competencies and essential behavioral modifications. The Barriers to Care Index was used in the Diabetes Registry Outcomes Project for A1C Reduction (DROP A1C) study of refractory patients. The study found that significant improvements in refractory glycemia can be achieved in the past when barriers are correctly identified, and individualized treatment pathways are successfully implemented. Interestingly, no single category of barriers-socioeconomic, psychological/support, comorbidities, accessibility, or cultural-was linked to a higher chance of response, suggesting that all barriers can be handled equally with the right level of individualization in treatment pathways. Furthermore, while gaps in knowledge are widespread, patient confidence and preparedness to initiate behavior change are also significant drivers (Aronson et al., 2018).

An essential component of health education is a precise evaluation of the patient's present degree of self-management. A study highlights the significance of doing a thorough and systematic patient evaluation before creating a customized self-management program

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(X. Wang et al., 2021). Scientific and standardized assessment instruments are essential to evaluate the degree of patient self-management. Presently, there are three components to diabetes self-management education: informational (knowledge) dissemination, health belief building, and behavior modification assistance. In particular, alterations in behavior indicate a successful assessment of the influence of diabetes education initiatives (Batalha et al., 2021). Consequently, knowledge, beliefs, and behavior modification are often the main foci of diabetes-related self-management assessment instruments. Existing evaluation instruments have several drawbacks. To start, a lot of tools are one-dimensional. Some emphasize knowledge (Hu et al., 2020), some concentrate on attitudes and convictions (Machado et al., 2020; Supramaniam et al., 2019), and a little emphasis on practice (Charron-Prochownik et al., 2007; Kamradt et al., 2014; Vincze et al., 2020).

Diabetes treatment overview (Fitzgerald JT, Davis WK, Connell CM, Hess GE, Funnell MM, 1998), although comprehensive evaluation instruments have rich measurement dimensions and a solid theoretical foundation, the large number of items in these scales could improve their practical implementation. Secondly, the fact that some scales' validity and reliability are only established at the time of scale formation limits how widely they can be applied. The validity and reliability of several scales are biased (Charron-Prochownik et al., 2007). Third, the practice scale emphasizes previous conduct the most (Liu et al., 2016; X. Wang et al., 2021), while the degree of readiness for additional behavior modification is given less consideration. The Diabetes Self-management Knowledge, Attitude, and Behavior Assessment Scale (DSKAB), for instance, (Liu et al., 2016), patients may have experienced memory bias because of the extended time frame (6 months) in which they were asked to recollect their conduct. Developing and implementing a patient-centered self-management method requires accurately evaluating a patient's capacity and preparedness before beginning self-management behaviors (Kiehn & Car, 2017).

The Skills, Confidence & Preparedness Index (SCPI) was our selection (Aronson et al., 2019; Mbuagbaw et al., 2017; X. Wang et al., 2021) This scale is an "all in one" that incorporates three essential components of diabetes self-management simultaneously, so it

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has to be translated, modified, and validated in the Indonesian community. The knowledge of skills is predicated on the substance of the Canadian Clinical Practice Guidelines (CPG), the Basics of diabetic self-management, and the seven AADE self-care activities (Cheng, 2013), includes a nutritious diet, prescription drugs, physical activity, Glucose monitoring and strategies for solving problems, risk mitigation, and good strategy mechanisms. Self-efficacy theory (SET) is the foundation for believing one can do a skill (Bandura, 1977). The conviction that one can perform a particular behavior and get outcomes that meet expectations is known as self-efficacy.

According to the Transtheoretical Model of Health Behavioral alter theory, which is applied here, people will act to alter their behavior within a specific time frame before they are ready to use skills (H. Wang et al., 2022). This instrument assesses patients' willingness to modify their behavior and their likelihood of doing so. This component includes stress management, nutrition, exercise, preventing hypoglycemia, and using insulin when needed. This measure was created at the LMC Diabetes and Endocrine Clinic in Ontario, Canada, and it was confirmed in two additional cohorts. Fifty-one patients had their clinical response to the disease prevention program management examined. Before putting the health education program into action, SCPI assesses this so that teachers can promptly discover the knowledge, skill, self-confidence, and behavioral preparation gaps that diabetes patients have. The focus, particularly in the behavioral aspect, is on motivation to change behavior. By assessing diabetes patients' "behavioral preparedness" stage, we may better understand their needs and offer a foundation for health educators to implement suitable tactics, allowing medical personnel to determine "which they need to teach first." Patients receive more individualized education as a result of educational projects. After three months, the patient's glycosylated hemoglobin levels increased dramatically (9,3±1,0% vs 8,2±0,9%, p<0,001) (Aronson et al., 2019).

The SCPI has been well-validated in Canada, plays a significant role in assessing the current state of self-management and behavioral preparedness for diabetes patients, and can help encourage health educators to educate patients. Its applicability in Indonesia needs to be studied further. Hence, this research aims to translate, modify, and validate the "Skills,

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Confidence, and Preparedness Index (SCPI) into Indonesian for use in adult type 2 diabetes patients in Indonesia."

2. Research Method

a. Study Population and Technique

People who have type 2 diabetes are the intended focus. From October 2023 to January 2024, sampling was conducted at four community health centers. Patients over the age of ≥ 18 were considered eligible (Society, 2018), to have type 2 diabetes for a minimum of six months.

We explicitly explain why patients fill out the questionnaire and vow to respect their privacy before conducting an inquiry. Using the Google form link that we send over the WhatsApp platform, patients provide selected responses based on their daily diabetes management. If patients could not read, we advised them to complete the questionnaire instead. Each question has a visual analog scale with an anchor that aids in scoring between 0 and 10. The patient's assessments are then numbered from 1 to 10. The total score is a simple average of 10, with each of the three subscales (skills, confidence, and preparedness) producing a score of 10.

Age, gender, education level, residence status, BMI status, marital status, health insurance, Occupational status, smoking status, monthly income, views on health status, duration of diabetes, and family history of diabetes were self-reported by participants. Bakti Tunas Husada Tasikmalaya University Ethics Number authorized the research protocol and papers (290/E.01/KEPK-BTH/XI/2023).

The research is divided into two sections. After adapting it translingually in the first, we validated the Indonesian version of SCPI in the second phase.

Phase one: translingual adaption of SCPI.

The method of cross-cultural scale adaptation involves determining the equivalency between the indigenous and original scales. In this phase, we adhere to a systematic approach of guidelines set by the American Academy of Orthopedic Surgeons Evidence-

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Based Medicine Committee (AAOS) (Beatson E Dorcas, Bombardier Claire, 2000) This comprises forward translation, translation synthesis, back translation, expert committees, and translation version testing.

1. Forward translation

   Two independent language translation experts with Indonesian educational backgrounds translate the English version of each SCPI question into Indonesian, preserving as much of the original meaning as possible. They created translated versions of T1 and T2.

2. Translation synthesis

   A nursing expert fluent in Indonesian assessed the two translated versions of the T1 and T2 scales and contrasted them to the authentic scale to identify poorly understood vocabulary. The research team discussed the authentic English document, two interpretations, expert opinions, and any uncertainties or contradictions. After achieving an agreement, it was moved to the T3 version of the Indonesian translation.

3. Retranslation

   The reconciled version was then back-translated by three people: a nursing student with study abroad experience, a nursing specialist living abroad, and a linguist with no medical background. They made T3-1, T3-2, and T3-3 versions of the translation. Neither of them read the original English scale. Three source scale authors and closely related nursing experts compared the accuracy of the three back-translation versions and discussed any uncertainties with the research group. The final version of T4 was created based on the Language Coordinator's input.

4. Expert committee

   We invited six bilingual professionals to join an expert panel, which included two noncommunicable disease program holders (diabetes mellitus program holders), three nursing experts in charge of the PPROLANIS program, and a long-term illness management specialist. Experts assessed the Indonesian interpretation and translated scale using a 5-point Likert scale based on the original English version. There are five options: fully consistent, highly consistent, generally consistent, and less consistent,

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and inconsistent, with values ranging from five to one point. Experts make remarks and ideas about things that need to be understood. Following the assessment, expert comments and suggestions changed the Indonesian translation scale.

5. Testing the Indonesian version

   We recruited 57 individuals with type 2 diabetes, and you have to tick the scale. Then, we utilized an interview format method to evaluate sufferers' comprehension of the level description, input, and replies to determine whether the scale description was easy to understand and if the remarks were ambiguous or unclear. All responders were asked to answer open-ended questions. (1) Are there any questions that you do not understand? (2) If so, what approach did you take? (3) Do you think the scale's items are relevant, or do you find the explanations confusing and difficult to understand? (4) If you believe there are difficulties, please specify which goods are unsuitable and why. Can you provide the exact expression? The Indonesian scale version was finalized after additional adjustments were made after the interview process. Patients were then asked to complete the questionnaire again one week later to evaluate test-retest reliability.

Second stage: validating the Indonesian version of SCPI

Validity and reliability tests are performed at this stage, with composite reliability, Cronbach alpha, and average variance being assessed and the goodness of fit utilizing determinant coefficient testing and model appropriateness testing based on the R-squared statistical value for each variable.

b. Instrument

LMC Skills, Confidence & Preparedness Index (SCPI)

Skills, Confidence & Preparedness Index (SCPI) Questionnaire (Aronson et al., 2019; X. Wang et al., 2021) is a questionnaire that measures three critical areas of diabetes patient self-management: knowledge of skills (9 items), confidence in performing the skills (7 items), and readiness to apply the skills. Skills (7 items) consist

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of 23 components. Each item is rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). According to X. Wang et al. (2021), the Chinese version of the SCPI (C-SCPI) shows strong internal consistency, with a Cronbach's alpha of 0.92 (X. Wang et al., 2021).

Table 1. Questionnaire SCPI Indonesian Version

1. Skills/Knowledge

Questions These questions explore your knowledge of diabetes management Skills.

No	Questions
1	Saya tahu cara merencanakan makanan yang memiliki keseimbangan terbaik antara karbohidrat, protein, dan sayuran
2	Saya mengetahui cara kerja obat diabetes saya (pil, suntikan dan/atau insulin) bagi tubuh saya
3	Saya tahu kapan harus memeriksakan gula darah saya jika saya ingin melihat bagaimana respons tubuh saya terhadap makanan yang dikonsumsi.
4	Saya tahu kapan harus memeriksa gula darah saya untuk menentukan apakah dosis obat atau insulin saya tepat atau belum.
5	Saya tahu apa yang harus dilakukan untuk mencegah gula darah saya ketika rendah ketika saya melakukan olahraga (baik sebelum, selama, atau sesudahnya)
6	Ketika tubuh saya tidak merasa nyaman, saya tahu apa yang harus saya lakukan secara berbeda dalam penatalaksanaan diabetes saya
7	Saya tahu bagaimana stres dapat mempengaruhi pengelolaan/pengobatan diabetes saya.
8	Ketika saya melihat hasil gula darah saya setelah pemeriksaan minggu tertentu, saya dapat menjelaskan pola gula darah saya (naik/turun).
9	Saya tahu berapa target hasil kadar A1c, tekanan darah, dan kolesterol saya.

2. Confidence Question

These questions explore your level of confidence in the above diabetes management skills.

No	Questions
1	Saya yakin dapat merencanakan makanan dan camilan yang seimbang
2	Saya yakin bahwa saya dapat mengelola stres saya.
3	Saya yakin dapat mencegah rendahnya gula darah selama atau setelah berolahraga.

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4	Saya yakin bahwa lain kali saya makan di luar, saya akan dapat memilih makanan yang paling sesuai dengan target gula darah saya.
5	Saya yakin saya bisa memasukkan olahraga ke dalam jadwal saya
6	Saya yakin bahwa saya dapat menggunakan gula darah harian saya untuk mengatur pola makan, aktivitas, dan/atau insulin saya.
7	Ketika sesuatu di luar rutinitas normal saya terjadi, saya yakin bahwa saya dapat memecahkan masalah dan menjaga gula darah saya dalam keadaan stabil

3. Preparedness Questions

These questions explore whether you are ready to make changes to your diabetes management in the next month.

No	Questions
1	Dalam sebulan ke depan, saya akan mulai mengonsumsi makanan dan snack yang lebih sehat.
2	Dalam satu bulan ke depan, saya akan memilih aktifitas fisik dan mengaturnya sesuai dengan jadwal kegiatan saya
3	Dalam satu bulan ke depan, saya akan membuat daftar pilihan manajemen stres yang cocok untuk saya.
4	Dalam satu bulan ke depan, saya akan secara konsisten membuat rencana ke depan untuk mencegah gula darah rendah
5	Dalam bulan depan, saya akan menggunakan dosis insulin sesuai dengan rekomendasi dokter atau tenaga kesehatan yang merawat saya
6	Dalam bulan berikutnya, saya akan mulai melakukan perubahan pada manajemen diabetes saya berdasarkan gula darah harian saya (misalnya - pola makan, aktivitas dan/atau insulin).
7	Dalam bulan berikutnya, saya akan mulai melakukan perubahan pada manajemen diabetes saya untuk mencapai tujuan saya secara keseluruhan (misalnya - makan, aktivitas dan/atau insulin).

c. Statistic Analysis

The frequency distribution and mean of each variable are used to depict the overall characteristics of the respondents. To test validity and reliability, use Smart PLS 3.2.9. Composite reliability, Cronbach alpha, and average variance should all be assessed to assure validity and reliability. The goodness of fit is assessed using determinant coefficient and model appropriateness testing. The test is determined by assessing the R-squared statistical value for each valid relationship. Check for direct and indirect associations if the significant variable's p-value is less than 5%.

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3. Results And Discussions

a. Result

1. Phase one: trans-language SCPI validation

The translation results are comparable to the original English version. Eight adjustments were implemented following the expert committee. The expert review found that the average score of all items in the translation process was greater than 3 points, with 74% scoring more than 4 points, consistent with the original text. In the back translation section, all items have points greater than three, with 61% exceeding four Aside from that, replacing "pain" with "my body doesn't feel comfortable" in item 6 can help patients pay greater attention to changes in their bodies. In item 7, one specialist indicated that "my stable diabetes condition remains within normal limits" to stabilize my blood sugar. Item 8 changes the term "a more balanced snack" to "a healthier snack." At the end of item 9, the phrase "sports activities and starting to adjust them to my schedule" has been changed to "physical activities and organizing them according to my schedule." In point 10, the wording "stress management options that are suitable for me" is changed to stress management solutions that best suit my needs. In point 21, two experts suggested that patients should not be encouraged to alter their insulin dose since insulin dose adjustments should be made depending on the patient's condition and the kind of insulin used. Considering the clinical situation in which patients must adjust insulin doses under the supervision of a doctor or health professional, the panel decided to change "I will start adjusting my insulin dose myself" to "I will use my insulin dose according to the recommendations of the doctor or health worker who treats me."

Table 1 shows the sociodemographic statistics of the respondents who tested the translated version.

Table 1: Sociodemographic Characteristics of Respondent

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No	Respondent Characteristics	Frequency	Percentage	Mean
1	Age			
	a. <40 years	11	19.3	2.28
	b. 40-49 years	29	50.9	
	c. 60-64 years	7	12.3	
	d. ≥ 65 years	10	17.5	
2	**Gender**			
	a. Man	15	26.3	
	b. Women	42	73.7	
3	**Education**			
	a. Elementary school - junior high school	27	47.4	1.84
	b. Senior High School	12	21.1	
	c. University	18	31.6	
4	**Status of Home**			
	a. Live alone	2	3.5	1.96
	b. Live with family	55	96.6	
5	**BMI Status**			
	a. < 18.5 underweight	2	3.5	2.54
	b. 18.5-22.9 Normal weight	25	43.9	
	c. 23-29.9 Overweight.	27	47.4	
	d. > 30 obesity	3	5.5	
6	**Marital Status**			
	a. Married	41	71.9	
	b. Widower /widow	7	12.9	
	c. Not married or single.	9	15.8	
7	**Health Insurance**			
	a. BPJS	50	87.7	1.18
	b. Not Having Health Insurance	4	7.0	
	c. Health insurance other than BPJS	3	5.3	

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No	Respondent Characteristics	Frequency	Percentage	Mean
8	**Occupational status**			3.74
	a. government employees	6	10.5	
	b. Private sector employee	3	5.3	
	c. Businessman	5	8.8	
	d. Doesn't Work	29	50.9	
	e. Others	14	24.6	
9	**Smoking status**			2.68
	a. Yes, Smoking	4	7.0	
	b. No, but I have smoked	10	17.5	
	c. Never smoked at all	43	75.4	
10	**Income Status**			1.40
	a. < 2.500.000	34	59.6	
	b.≤ 2.500.000	23	40.4	
11	**Perspectives on Health Status**			3.26
	a. Perceived Health Status	21	36.8	
	b. Attitude toward Health	7	12.4	
	c. Patient compliance with self-management	18	31.6	
	d. This is all true	11	19.3	
12	**Long suffering with diabetes**			1.30
	a. ≤ 5 Tahun	40	70.2	
	b. > 5 Tahun	17	29,8	
13	**Family history**			2.18
	a. Yes (parents, brothers and sisters or own children).	22	38.6	
	b. Yes (grandfather,	3	5.3	

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No	Respondent Characteristics	Frequency	Percentage	Mean
	aunt, uncle, or first cousin)			
	c. There isn't anything.	32	56.1	
Total		57	100	

Six more modifications were made following patient interviews. Three of the patients did not grasp what carbohydrates were. follows the idea of experimental equivalence (Beaton et al., 2000), we describe carbs as foods containing starch or sugar and provide a detailed explanation. Some people are unsure about the breadth of diabetes self-care management. Therefore, we define the scope of diabetes self-care management, which includes food, medication, exercise, and blood sugar monitoring. Five individuals were also unclear about phrases like "blood sugar patterns," "keeping my diabetes on track," and "stress management." We altered the "blood sugar pattern" to "change in blood sugar level values" and explained why. The patient also noted that "keeping my diabetes on track" was not appropriate for the Indonesian language. Therefore, we revised it to "controlling blood sugar levels under normal circumstances." We use "stress management" as "a way to deal with stress."

2. The second phase is to validate the Indonesian version of SCPI.

a. Validity and reliability testing

Data processing is done with Smart PLS 3.2.9, and the indicators for testing validity and reliability include composite reliability, Cronbach alpha, and average variance. Table 2 presents the results of the validity and reliability tests.

Table 3: Composite Reliability Values, Cronbach Alpha, and Average Variance

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Preparedness	0.866	0.883	0.904	0.654
Confidence	0.850	0.851	0.893	0.626
Skill/Knowledge	0.775	0.781	0.844	0.520

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According to Table 3, the AVE value for all variables is > 0.5, indicating that all valid indicators converge to form their respective variables. Also, Cronbach alpha and CR values were also obtained with values > 0.6 for all variables. It can be determined that all variables and items in question are legitimate and reliable in variable measurement.

b. Goodness of Fit Testing

This test is designed to examine whether the relationship between each variable is satisfactory. This test's indicators are the coefficient of determination and the model appropriateness test. The coefficient of determination measures how much the independent variable contributes to explaining the connection with the dependent variable. The coefficient of determination is calculated by examining the R-squared statistical value for each variable association.

Table 4 Goodness of Fit Testing

	R Square	R Square Adjusted
Confidence	0.312	0.299
Preparedness	0.536	0.519

Table 4 shows that the confidence and preparedness variables had R-Square values of 0.312 and 0.536, respectively. This number indicates that the Confidence and Preparedness variables contribute 5.36% to explaining the Preparedness variable, with the remaining 94.64% explained by variables outside of this model. Aside from that, the Skill/Knowledge, Confidence, and Preparedness variables each explain 3% of the Confidence variable, with the remaining 97% explained by variables outside the model.

b. Discussion

Self-care management is critical for people with diabetes to control their blood sugar levels. SCPI focuses not only on diabetes mellitus patients' knowledge and self-confidence in self-management but also on their willingness to change their behavior. In clinical practice, the scale immediately reflects diabetes patients' self-care

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management level and directs healthcare practitioners in developing health plans for people with diabetes.

The first part of the research describes the development of the Indonesian version of the SCPI (SCPI-I), which was translated and changed from the original instrument following a systematic and rigorous method. We followed standards (Beaton et al., 2000) for adaptation and culture in Indonesia. Some variations in translation between the two translators may be due to variances in their interpretations of natural phrases.

Expert input on scale content is required during the trans-linguistic validation procedure. They are requested to revise or give suitable phrasing as needed (Sigurdardottir & Benediktsson, 2008). Aside from language adjustments, the expression's semantics can be clarified by altering "how my diabetes medication (pills/injections and insulin) works in my body" to "how diabetes medication (pills, injections, and insulin) works in lowering blood sugar levels." At the same time, they provided professional advice on insulin dose changes based on Indonesian clinical practice. We also spoke with the authors of the scale sources about the ability of diabetes patients in Indonesia to regulate their insulin doses. When patients start insulin treatment, they are often given specific instructions on adjusting their dose. Patients take insulin by their doctor's instructions.

The criterion validity results suggest that the trust dimensions in the I-SCPI correspond well with skill/knowledge, confidence, and preparedness. An individual's knowledge, abilities, and confidence in managing chronic disease can empower them to take an active role in their health and care (Lightfoot et al., 2022). Kugai et al. conducted a cross-sectional survey on 170 peritoneal dialysis patients who engaged in routine self-care education and quality care activities to demonstrate the benefits of increased self-care knowledge (Kugai et al., 2023). According to Juarez et al.'s survey of 1,318 type 2 diabetes patients, those with higher education had higher scores on self-care activities such as general eating patterns, physical activity, independent glucose monitoring, foot care, and the ability to coordinate monitoring. glucose separately

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(Juarez et al., 2022). A review conducted by Hermanns et al. found that in carrying out self-care (for example, monitoring glucose close to normal), diabetes patients must understand the administration of insulin and taking medication, eating habits, exercise, foot care, and maintaining healthy lifestyle habits requires increased preparedness knowledge and literacy (Hermanns et al., 2022).

To assess diabetes patients' self-care management behavior, it is necessary to distinguish between those with well-controlled blood glucose levels and those without. The study found that the SCPI can effectively distinguish between patient self-care management behaviors with varying blood glucose control outcomes. Patient confidence levels are consistent with studies (Asmat, 2024; Campbell et al., 2012) This demonstrates that patients with better glycemic control and self-management levels have greater empowerment and self-confidence in self-care illness management. In addition, 47% of the 300 individuals with reported glycemic levels in this study were over 60. Among 143 individuals above 60, 65% had poor blood glucose control. Other studies demonstrate that increasing age hurts the amount of awareness about diabetes (Li et al., 2019), older people should be the focus of health education. There was no statistically significant difference between the two groups in the SCPI readiness component, which could be attributed to future changes in glycolic hemoglobin. In summary, the I-SCPI is a trustworthy tool for assessing diabetes patients' degree of self-management, and it also demonstrates that assisting diabetes patients in improving their level of self-care management improves blood glucose control outcomes.

This model can be made more theoretically consistent by allowing more item routes (Kwok et al., 2012). This study introduced six covariance coefficients to the preset model, which could be related to the same latent potential. Knowledge, attitudes, and diabetes self-management practices were all connected. Although this scale has three aspects: knowledge and skills, self-confidence, and behavioral preparation, components from these dimensions may be connected. For example, Q14 and Q18 assess the patient's daily physical activity, with Q14 concentrating on the patient's confidence in exercising and Q18 on the patient's preparedness for exercise. If the

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patient is confident in their ability to exercise, they will begin exercising next month, so there may be a link between questions 14 and 18. Similarly, Q5 and Q12, Q5 and Q20 assess hypoglycemia avoidance; Q11 and Q9 assess patient stress regulation; and Q10 and Q17 address the patient's nutrition.

Taking the theoretical foundation of SCPI into account, the statistical significance of all elements in the model and the goodness-of-fit index significantly improved after the data were adjusted. The I-SCPI, with its three-factor structure, was accepted. The I-SCPI's internal consistency is satisfactory, with Cronbach's alpha > 0.60 (table 2) for the complete scale (Lance et al., 2006). These findings agree with those presented in the original English version (Aronson et al., 2017). Interpretability assesses a questionnaire's ability to translate quantitative scores or changes in scores into qualitative meaning. The MCID value is the minimum change score at or above which the change is considered (according to some definitions) significant (Beaton et al., 2002; Sloan et al., 2003). When the SCPI score change value exceeds the MCID (minimum clinically relevant differences, or the score received by the patient that represents changes in clinical interventions that are useful to the patient), diabetes mellitus patients' self-management ability changes.

Test-retest reliability coefficient on the scale For the first time, patients can confer with professionals about unclear knowledge points, after which they can form their own opinions and understanding of diabetes and grasp the relevant knowledge about diabetes. The test-retest reliability of the SCPI may be stable due to the initial measurement results; nevertheless, further work is required to evaluate the test-retest dependability rigorously. This shows that SCPI has an educational effect on diabetic patients' self-care management.

There are significant limitations to the current assessment that must be addressed. The original SCPI scale was created and validated in individuals with type 1 and type 2 diabetes. However, this study only looked at patients with type 2 diabetes. Because the sample in this study was mostly drawn from patients at four community health centers in Tasikmalaya, the sample's applicability to diabetic outpatients,

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hospitals, and the general public requires more investigation in the future. The SCPI could be used in health education programs to investigate the influence of the scale on improving blood glucose levels and self-care management behavior.

4. Conclusion

Our study adhered strictly to cross-cultural scale adaption requirements. The reliability and validity of the SCPI scale were tested after the initial version was developed. I-SCPI has strong interval consistency and meets the validity and discriminatory validity criteria. This provides an effective measurement method and a theoretical framework for researching the amount of self-care management and behavioral preparedness of diabetic patients.

5. Compliance With Ethical Standards

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Abbreviation

SCPI The LMC Skills, Confidence & Preparedness Index

AAOS : American Academy of Orthopaedic Surgeons Evidence Based Medicine Committee

IDF : The International Diabetes Federation

AADE : The American Diabetes Education Association

SET : Self Efficacy Theory

MCID : Minimal clinically important difference

Disclosure of conflict of interest

This research collaboration is a positive thing for all researchers so that conflicts, problems and others are absolutely no problem for all writers.

Statement of informed consent

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Every action we take as authors is a mutual agreement or consent.

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