The Validity and Reliability of The Indonesian Version of Diabetes Mellitus Self Efficacy Scale

by Calon Dr. Theresia Titin Marlina Et Alia

Submission date: 24-Oct-2022 12:21PM (UTC+0700)
Submission ID: 1933704857
File name: 1._Draft_manuskrip_DMSE_S_Check.doc (225.5K)
Word count: 4668
Character count: 24896

The Validity and Reliability of The Indonesian Version of Diabetes Mellitus Self Efficacy Scale

Theresia Titin Marlina[1,2], Widyawati[3], Haryani[4*]

[1] Panti Rapih School of Health Sciences, Tantular street 401, Condong Catur, Depok, Sleman, Yogyakarta, Indonesia, 55283
[2] Doctoral Program, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Farmako Street Yogyakarta, Indonesia, 55281
[3] Department of Pediatric and Maternity Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Farmako Street Yogyakarta, Indonesia, 55281
[4] Department of Medical Surgical Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Farmako Street Yogyakarta, Indonesia, 55281.

Addrees of correspondence author: Department of Medical Surgical Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Farmako Street Yogyakarta, Indonesia, 55281, fax. + 62 274 581 876, +62 274 548 846, Telp. + 62 274 560300, email: haryani@ugm.ac.id

ABSTRACT

Backgrounds: The prevalence of diabetes melitus (DM) in Indonesia and its complication are increasing. This condition will affect the decreased quality of life (QOL). Diabetes self-management become a promising approach to controlling blood glucose and improving QOL. Self-efficacy is a vital component in diabetes self-management. However, lack of valid and reliable scale to measure self-efficacy in the Indonesia Version.

Objective: This study aims to translate Diabetes Mellitus Self Efficacy Scale (DMSES) and test its psychometrics among diabetic patients in Indonesia.

***Methods*:** The forward-backward translation method was used to translate DMSES into the Indonesian Version (DMSES-I). Furthermore, the content of validity, construct validity, and internal consistency was tested involving 227 adult patients with type 2 Diabetes Mellitus.

***Results*:** The item and scale content validity were 0.955 and 0.955, respectively. Three factors resulted from exploratory factor analysis with the KMO index was 0.922. The Cronbach's alpha coefficients of each item of DMSES-I ranged from 0.921 to 0.952, and the total was 0.928.

Implications for Nursing: Nurses can use DMSES-I to determine the self-efficacy of type 2 DM patients as a reference for providing health education, so the patient's knowledge increases and is followed by good behavior to achieve a quality of life.

***Conclusions*:** The DMSES-I is a valid and reliable instrument for measuring diabetes self-efficacy in Indonesia.

***Keywords*: diabetes melitus, self-management, Indonesian version, reliability, self efficacy, validity**

1. INTRODUCTIONS

The prevalence of type 2 diabetes mellitus (DM) has continued to increase, especially in low-income countries over the last few decades. This change is in line with the increasing age of the population and will continue to be 578 million in 2030 and 700 million in 2045 (1). The World Health Organization (WHO) predicts an increase in the number of people with type 2 DM (T2DM) in Indonesia from 8.4 million in 2000 to 21.3 million in 2030 (2). The 2018 Basic Health Research (Riskesdas) report stated that there was an increase in the prevalence of DM in Indonesia to 10.9% (2). The population of Indonesia suffers from DM, 6.2% or 10.8 million in 2020 (Center data and information of the Ministry of Health of the Republic of Indonesia). Indonesia is ranked 7th in the world at 10.7 million and 3rd in Southeast Asia with an 11.3% prevalence (1) (Kemenkes RI, 2020).

DM is the third largest cause of death in Indonesia at 6.7% (3). DM is a chronic disease whose prevalence is increasing with complications that can affect the decline in quality of life (4,5), requires long-term care and high treatment costs (6,7), and affects psychological conditions in the form of mild stress (8). This impact must be controlled by managing DM disease properly. Self-efficacy affects self-management. (9).

Self-efficacy is a belief or confidence in one's ability to do something to achieve goals. Self-efficacy is needed to make behavioral changes. Someone who has high self-efficacy has good self-care behavior (9). Everyone who has high self-efficacy will have good self-care behavior (10–12). The higher the self-efficacy of type 2 DM patients in China, the higher the self-management behavior (13). Self-efficacy is significantly related to self-management (14).

Self-efficacy can increase by providing health education. That was a significant difference after being given health education for six months in aspects of diet and foot care, medical treatment, and physical exercise with $p < 0.01$ (15). The role of a nurse as an educator can conduct diabetes self-management education to increase self-efficacy.

One of the self-efficacy measurement tools in DM patients is The Diabetes Management Self Efficacy Scale (DMSES). This self-efficacy scale was developed based on the self-care activities that the patient must do to manage his diabetes. DMSES consists of 20 questions about blood sugar monitoring, diet management and maintaining ideal body weight, physical activity, foot care, and following a treatment program (16). Researchers did not find DMSES in the Indonesian version (DMSES-I). The prevalence of DM sufferers in Indonesia is increasing with poor diabetes self-management behavior, so it requires nurses as health workers to have an active role in carrying out their role as educators. One of the bases for providing diabetes self-management education is knowing the patient's self-efficacy, so a DMSES-I questionnaire is needed. Based on this phenomenon, the researchers tested the validity of the DMSES-I reliability using Beaton's guidelines (17).

This study aims to translate DMSES into Indonesian and test its psychometrics to determine the acceptance and suitability of the Indonesian version of the application for DM patients in Indonesia.

2. MATERIALS AND METHODS

2.1 Study Design

This study used a cross-sectional design with a survey method. The researcher refers to the cultural adaptation guidelines (17), which use a forward-backward translation approach that consists of 6 stages: translation, synthesis, back translation, expert committee review, pretesting, and submission and appraisal.

2.2 Setting & participant

The participants recruited in the first stage (pretest) are adults with type 2 diabetes mellitus (T2DM), who can speak Indonesian, do not experience complications, do not have communication disorders or mental disorders such as depression or other mental illnesses, and are willing to become respondents, as many as 36 people. The number was determined based on (17), which stated that the pretesting used 30-40 patients. Participants rated the clarity and ease of understanding of the items.

In the second stage (reliability), participants recruited people with type 2 DM, Indonesian, who were willing to be respondents. Using Guilford's Rule of 200 (1954) shows that N must be at least 200 cases (18). The inclusion criteria were patients with type 2 DM at least 40 years old and willing to be respondents. The exclusion criteria have unable to read and speak Indonesian.

2.3 Questionnaire Diabetes Mellitus Self Efficacy Scale (DMSES)

Self-efficacy describes a person's belief in their ability to organize and carry out the necessary actions in dealing with prospective situations. This self-efficacy scale was developed based on the self-care activities that patients must do to manage their diabetes (16). DMSES consists of 20 questions. The aspects measured were confidence in self-management abilities, including:

1) Blood sugar monitoring (3 question items),
2) Diet settings and maintaining ideal body weight (11 question items),
3) Physical activity (2 question items),
4) Foot care (1 question item),
5) Follow the treatment program (3 question items).

The items use a scale of 0 to 10, with ratings that 0 is they can't do all, 10 is certainly can do it, and 5 maybe yes, maybe no. Interpretation uses the mean or means for each aspect. The higher the average, the better one's self-efficacy.

2.4 Research Procedure.

2.4.1 Translation procedure.

The author requested permission and obtained the DMSES manuscript from the original instrument developer Jaap Van der Bijl. The study approval from the Ethical Committee at the Universitas Gadjah Mada Yogyakarta Ref. No : KE/FK/0304/EC/2022. DMSE_S was translated into Indonesian by a sworn translator and a nurse who has a specialist in medical-surgical nursing and has clinical experience, as well as a nursing lecturer for 19 years. Two translators agreed on the results. The Indonesian version of DMSES was translated back into English by two

independently English translators. After completing the translation and back-translation processes, the researcher conducted an expert committee review to check the validity of the content, and then a pretest was carried out (Fig 1).

The expert committee consists of 10 people, consisting of 2 specialists in endocrine metabolism consultants, four practicing nurses working in the endocrine clinic with a nursing undergraduate education background, two medical surgical nursing lecturers with a master's and doctoral education background, a nutritionist with a master's education background and an English language expert with a master's education background. The expert committee reviewed by rating each item with a range of 1-4 (1=not relevant and 4=very relevant). Experts assess whether it is necessary to modify or remove items and provide input on existing items.

Translation process:

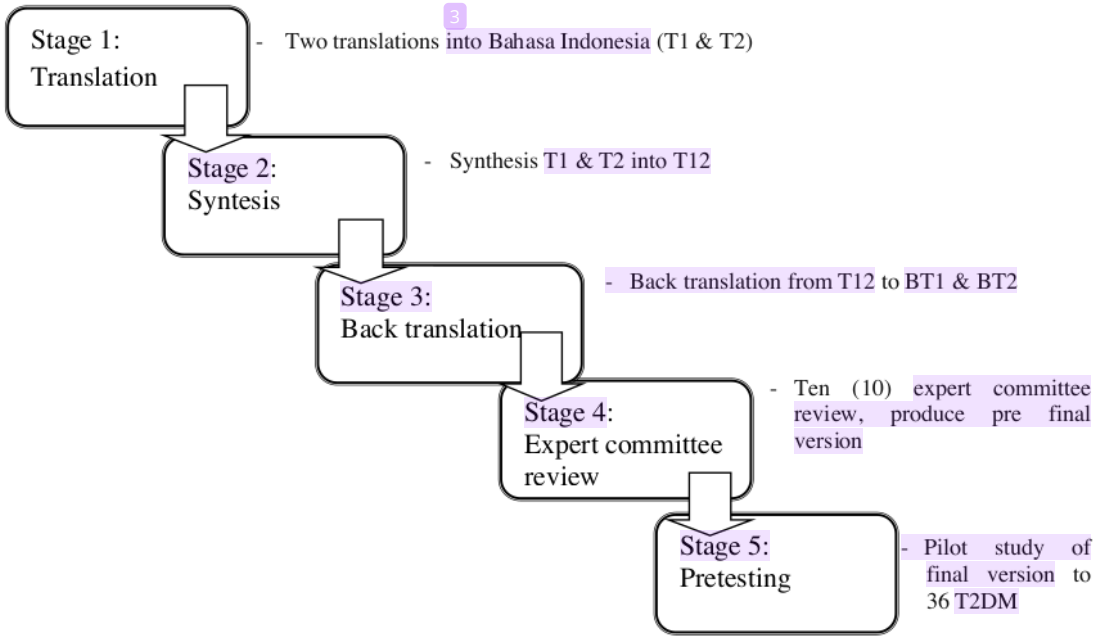

Figure 1. Translation process

2.4.2. Study procedures for pretest and DMSES_I validation.

Researchers used two stages, pretest/pilot study, and reliability. Researchers have conducted a pretest on 36 patients with type 2 diabetes mellitus who were examined in an internal medicine clinic at a private hospital in Bantul to assess the clarity and ease of understanding of the questions. The pretest stage was on March 23 – April 13, 2022.

In the reliability stage, the researcher used 227 types 2 DM patients in the internal medicine polyclinic of a private hospital in Kalasan and Bantul. Researchers collected data at the reliability stage from April 22 to July 23, 2022.

Researchers identified patients according to established criteria by looking at the hospital database according to the time of examination. And then explain the research and ask for approval to be a respondent. If the patient

understands and agrees, then sign the consent form. Researchers completed data collection stages 1 and 2 for three months.

2.5 Data analysis.

2.5.1 Content validity

The content validity of DMSES-I was analyzed using the Item-Content Validity Index (I-CVI) and the Scale-Content Validity Index (S-CVI). Two methods for calculating S-CVI, in which the average of the I-CVI scores for all items on the scale (S-CVI/Ave) and the proportion of items on the scale that achieve a relevance scale of 3 or 4 by all experts (S-CVI/UA).

I-CVI is The proportion of content experts giving the item a relevance rating of 3 or 4 or (agreed item)/ (number of experts). Experts assess with a 4-point scoring system (from 1 = irrelevant to 4 = very relevant), and are classified into relevant (scores 3 & 4) and irrelevant (scores 1 & 2) (19). The CVI value for 10 expert reviews is at least 0.78 (20).

2.5.2 Internal consistency and homogenitas

The reliability of the instrument uses the Alpha (Cronbach's) method. The reliability is indicated by the value of Cronbach's alpha if the item is deleted, compared to the value of the r table. Significance of 0.05 with two-sided test and the amount of data (n) 227, obtained r table 0.138.

2.5.3 Construct validity

Construct validity using Kaiser–Meyer–Olkin (KMO) and Bartlett's test. The suitability of applying Exploratory Factor Analysis (EFA) was verified using the KMO Index. The KMO and Bartlett result tests showed data had sufficient sampling and could be analyzed using EFA (21,22). This EFA determines the factors that appear based on the instrument items tested and their loading factor values. An item instrument can be removed if the loading factor is below 0.3 (23,24). If the KMO reaches 0.6 and Bartlett's Sphericity Test must be relevant at $\alpha<0.05$, the correlation matrix factorability is supposed (25).

3. RESULTS

3.1 Participant Characteristics

The pretest stage used 36 respondents with criteria for type 2 diabetes mellitus patients who were adults and could speak Indonesian, did not have complications and did not have communication disorders or mental disorders such as depression or other mental illnesses. The reliability stage uses 227 respondents with type 2 DM, at least 40 years old, who can speak Indonesian and are willing to be respondents (Table 1).

Table 1. Characteristics respondents on pretest step and reliability step.

	Pretest (n=36)	Reliability (n=227)
Age:		
a. 36 – 45 years	4 (11,11%)	21 (9,25%)
b. 46 – 55 years	13 (36,11%)	91 (40,09%)
c. 56 – 65 years	19 (52,78%)	73 (32,16%)
d. > 65 years	0 (0%)	42 (18,50%)
Sex:		
a. Male	13 (36.1%)	106 (46,7%)
b. Female	23 (63,9%)	121 (53,3%)
Long suffering:		
a. 0-5 years	20 (55,5%)	142 (62,5%)
b. 6-10 years	9 (25,0%)	47 (20,8%)
c. >10 years	7 (19,5%)	38 (16,7%)
Complications:		
a. IMA		1 (0,4%)
b. Asthma		3 (1,3%)
c. CHF		10 (4,4%)
d. Hypertension		42 (18,5%)
e. OA		1 (0,4%)
f. COPD		6 (2,6%)
g. Stroke		11 (4,8%)
h. None		153 (67,4%)
Ethnic:		
a. Java	36 (100%)	222 (97,8%)
b. Sunda	0	5 (2,2%)

3.2 Content validity and participant's feedback.

Content validity aims to identify language clarity, practical accuracy, and conformity with theory by experts. The results of the content validity of DMSES-I are I-CVI: 0.955, S-CVI/Ave: 0.955, and S-CVI/UA: 0.955. In addition, the language adjustment by an expert on Indonesian culture on two items, items 8 and 18. In item 8, sentences "examples of exercising are walking or cycling" and item 18, "health check every month." Researchers also collect qualitative feedback from participants. Participants had difficulty understanding items 13 and 16, so it took time to understand the sentences in question. For the other items, participants conveyed everything clearly and understandably.

3.3 Item analysis and Internal consistency.

Cronbach alpha DMSES-I was 0.928 with 20 items. Cronbach's alpha range is 0.921 – 0.952. Comparing Cronbach alpha value with the value of the r table at a significance of 0.05 with a two-tailed test and the number of data (n) 227, obtained r table 0.138. The DMSES-I Cronbach's alpha value obtained is greater than the r table, meaning that each DMSES-I item is reliable.

Table 2. The Reliability test per item

No	Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	I am able to check my blood sugar if necessary	145.31	1131.851	.582	.926
2	I am able to correct my blood sugar when the sugar level is too high (e.g. eat different food)	144.37	1145.153	.759	.922
3	I am able to correct my blood sugar when the blood sugar level is too low (e.g. eat different food)	144.12	1164.914	.711	.924
4	I am able to choose the correct foods	144.48	1148.251	.751	.923
5	I am able to choose different foods and stick to a healthy eating pattern	144.35	1144.495	.833	.922
6	I am able to keep my weight under control	144.41	1166.357	.653	.924
7	I am able to examine my feet for cuts	144.69	1165.099	.508	.927
8	I am able to take enough exercise, e.g. walking the dog or riding a bicycle	144.55	1137.647	.725	.923
9	I am able to adjust my eating plan when ill	143.96	1128.698	.239	.952
10	I am able to follow a healthy eating pattern most of the time	144.30	1147.315	.786	.922
11	I am able to take more exercise if the doctor advises me to	144.47	1148.418	.687	.923
12	When taking more exercise I am able to adjust my eating plan	144.49	1145.331	.765	.922
13	I am able to follow a healthy eating pattern when I am away from home	144.52	1137.844	.803	.922
14	I am able to adjust my eating plan when I am away from home	144.59	1134.190	.806	.921
15	I am able to follow a healthy eating pattern when I am on holiday	144.51	1142.233	.747	.922
16	I am able to follow a healthy eating pattern when I am eating out or at a party	144.70	1135.211	.760	.922
17	I am able to adjust my eating plan when I am feeling stressed or anxious	144.67	1139.533	.759	.922
18	I am able to visit my doctor once a year to monitor my diabetes	143.77	1178.118	.542	.926
19	I am able to take my medication as prescribed	143.46	1192.471	.521	.927
20	I am able to adjust my medication when I am ill	143.63	1151.065	.565	.926

3.4 Construct validity

Construct validity was tested through exploratory and confirmatory factor analysis. The analysis uses person correlation analysis, with a reliability level of 95% and a margin of error of 5%. Verify the suitability of the EFA application for this research data set using KMO. KMO value = 0.922, indicating that the data is suitable for factor analysis. Bartlett's sphericity test was significant ($\chi 2$ = 3882,355, Df = 190, p 0.000) (Table 3), allowing EFA to be performed. EFA found three factors on the 20 items, which are nutrition management (7 items), physical exercise and foot care (6 items), and Glucose control and medical treatment (6 items). Factor loading is between 0.386 to 0.823 (Table 2). There is one item with a loading factor of 0.191 (< 0.3). (Table 4).

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.922
Bartlett's Test of Sphericity	Approx. Chi-Square	3882.355
	df	190
	Sig.	.000

Table 4. Exploratory factor analysis (EFA) test of the final DMSES-I

	Factor		
	1	2	3
15. Mematuhi pola makan ketika berlibur	.823		
14. Mengatur pola makan ketika di luar rumah	.813		
16. Mematuhi pola makan ketika menghadiri pesta di luar rumah	.802		
13. Mematuhi pola makan ketika di luar rumah	.802		
17. Mengatur pola makan ketika stres	.714		
8. Olahraga cukup		.758	
11. Olahraga sesuai saran dokter		.739	
12. Mengatur pola makan ketika byk OR		.683	
4. Memilih makanan yang tepat		.555	
10. Menerapkan pola makan sehat		.550	
6. Mengontrol BB		.540	
7. Memeriksa kaki		.529	
5. Memilih makanan berbeda & menjaga pola makan		.528	
1. Periksa gula darah mandiri		.455	
3. Mengontrol gula ketika rendah			.795
2. Mengontrol gula ketika tinggi			.759
19. Mengkonsumsi obat sesuai resep			.620
18. Memeriksa kondisi setiap bulan			.507
20. Mengatur obat ketika sakit			.386
9. Menyesuaikan rencana makan ketika sakit		.177	
Initial Eigenvalues:			
% of Variance	53.688	7.356	6.780
Cumulative %	53.688	61.044	67.825

DMSES-I : The Diabetes Mellitus Self Efficacy Scale Indonesian Version

4. DISCUSSION

The validity of the DMSES reliability in Indonesian using a forward and backward translation approach. The final version of DMSES-I has internal consistency with Cronbach's alpha of 0.928. All DMSES-I items are reliable. The United Kingdom version of the DMSES has an internal consistency with Cronbach's alpha of 0.89 (26) and the original DMSES of 0.81 (16). There are two adjustment items, which are items 8 and 18. Sentences walking with the dog in item 8 adapted to customs or culture in Indonesia to be walking. Walking has a broader meaning in Indonesia. Walking according to the Big Indonesian Dictionary is to take a step forward. The habits of Indonesian people are that some people haven't the habit of walking with pets such as dogs.

Item 18 DMSES that “I can visit my doctor once a year to monitor my diabetes”. The recommendation from the expert changed the sentence “I can visit my doctor once a month to monitor my diabetes”. In Indonesian refers to an activity of health check-ups regularly every month. Type 2 DM patient should check their health condition regularly, blood sugar levels at least once a month, and HbA1C every three months in Indonesia. For patients who have controlled HbA1C levels at least two times a year (2), a general check-up is every year. The author's adjustment of these two items has received permission from the developer, with consideration adapted to the characteristics of the local culture.

The result of the KMO, which is higher than Kaiser and Rice's (1974), proposed a minimally acceptable value of 0.5. KMO value is 0.922, indicating that the data is feasible for factor analysis. Values above 0.9 are called marvelous. Such findings present a reasonable basis for progressing to the next stage (27). The size of the eigenvalues and the percentage of the stated variance use the decision for a factor variable. This research considers only factors that are equivalent to or higher than one to be significant and that at least 60% of the total variance is satisfactory (28). The eigenvalues just above that reflect 67.825 % of the total variance with about 6.780 of its eigenvalues.

EFA found three factors for the 20 items, which are nutrition management (7 items), Physical exercise and foot care (6 items), and Glucose control and medical treatment (6 items). Factor loading is between 0.386 to 0.823 (Table 4). The DMSES item 9 that adjusting the meal plan when sick have a loading factor of 0.177 (< 0.3). The item can remove because below 0.3 (23,29). The minimum acceptable loading factor is 0.3-0.4 and values greater than 0.5 are generally considered necessary for practical significance (28). This result is different from the original DMSES in that there are four factors, are Factor 1: nutrition-specific and weight (5 items), Factor 2: general nutrition and medical treatment (9 items), Factor 3: physical exercise (3 items), and Factor 4: blood sugar (3 items). This difference is due to the number of respondents. The original DMSES used 94 participants, while the DMSES-I used 227 participants. However, this difference in factors does not affect the validity and reliability of the instrument. The adequacy of the sample size might be evaluated by the following scale, 50=very poor; 100=poor; 200=fair; 300=good; 500=very good; and 1000 or more is excellent (29), should be at least 200 (18), recommended sample size ranges from 100-200 (30). The larger sample will usually lead to a clear indication of the number of factors.

5. IMPLICATIONS FOR NURSING

The DMSES-I is a new tool for assessing the self-efficacy of patients with diabetes. DMSES-I is used by health workers, especially nurses, to know the self-efficacy of DM patients. Nurses can provide appropriate health education based on the results of the assessment. High self-efficacy of type 2 DM patients can manage diabetes behavior properly, thereby minimizing complications and improving their quality of life.

6. CONCLUSIONS

The DMSES-I is a valid and reliable instrument for measuring DSM behavior in the Indonesian community, especially among patients in primary healthcare. The findings highlight the importance of promoting health

education by a nurse to improve diabetes self-efficacy, which affects the management behavior and quality of life of patients with type 2 diabetes.

LIST OF ABBREVIATIONS

DMSES	= Diabetes Melitus Self Efficacy Scale
DMSES-I	= Diabetes Melitus Self Efficacy Scale Indonesian version.
DSM	= Diabetes Self Management
T2DM	= Type 2 Diabetes Melitus
QOL	= Quality of Life
DM	= Diabetes Mellitus
WHO	= World Health Organization
I-CVI	= Item-Content Validity Index
S-CVI	= Scale-Content Validity Index
S-CVI/Ave	= scale-level content validity index based on the average method
S-CVI/UA	= scale-level content validity index based on the universal agreement method
KMO	= Kaiser–Meyer–Olkin
EFA	= Exploratory Factor Analysis

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Approval for the study was obtained from the Ethical Committee at the Universitas Gadjah Mada Yogyakarta Ref. No : KE/FK/0304/EC/2022.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation, and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all the participants.

AVAILABILITY OF DATA AND MATERIALS

Not applicable.

FUNDING

This research receive funding from the 2022 Final Project Recognition Grant program, Universitas Gadjah Mada.

CONFLICT OF INTERESTS

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ACKNOWLEDGMENTS

Author Contributions

Study conception and design: TTM, W, H

Data collection: TTM

Data analysis and interpretation: TTM, W, H

Drafting of the article: TTM, W, H

Critical revision of the article: TTM, W, H

REFERENCES

[1]. Kemenkes. Tetap Produktif, Cegah, dan Atasi Diabetes Melitus 2020. Pusat Data dan Informasi Kementrian Kesehatan RI. 2020;1–10.

[2]. PERKENI. Pedoman Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 Dewasa di Indonesia 2015. (2015). PB PERKENI. PB Perkeni. 2021. 1–104 p.

[3]. Kemenkes RI. Diabetes Fakta dan Angka. Vol. 161, Info Datin. 2018. p. 1058–63.

[4]. de la Cruz JPS, Morales DLG, González-Castro TB, Tovilla-Zárate CA, Juárez-Rojop IE, López-Narváez L, et al. Quality of life of Latin-American individuals with type 2 diabetes mellitus: A systematic review. Prim Care Diabetes. 2020;14(4):317–34.

[5]. Jing X, Chen J, Dong Y, Han D, Zhao H, Wang X, et al. Related factors of quality of life of type 2 diabetes patients: a systematic review and meta-analysis. Health Qual Life Outcomes. 2018;16(1):1–14.

[6]. Moucheraud C, Lenz C, Latkovic M, Wirtz VJ. The costs of diabetes treatment in low- A nd middle-income countries: A systematic review. BMJ Glob Heal. 2019;4(1):1–12.

[7]. Riddle MC, Herman WH. The cost of diabetes cared an elephant in the room. Diabetes Care. 2018;41(5):929–32.

[8]. Livana, Sari P, Hermanto. GAMBARAN TINGKAT STRES PASIEN DIABETES MELLITUS. J Perawat Indones. 2018;2(1):41–50.

[9]. Bandura A. Self-efficacy: Toward a Unifying Theory of Behavioral Change. APA PsycArticles. 1978;84(2):191–215.

[10]. Malini H, Yeni F, Pratiwi CA, Lenggogeni DP. Associated Factors of Self-Management in Type 2 Diabetes Mellitus at Community Health Center. J Keperawatan Soedirman. 2020;15(2):24–30.

[11]. Mustarim SW, Nur BM, Azzam R. FAKTOR – FAKTOR YANG BERHUBUNGAN DENGAN SELF MANAGEMENT PADA PASIEN DM TIPE II. J Telenursing. 2019;8(5):55.

[12]. Sabil FA, Kadar KS, Sjattar EL. Faktor – Faktor Pendukung Self Care Management Diabetes Mellitus Tipe 2: a Literature Review. J Keperawatan. 2019;10(1):48.

[13]. Yao J, Wang H, Yin X, Yin J, Guo X, Sun Q. The association between self-efficacy and self-management

behaviors among Chinese patients with type 2 diabetes. PLoS One. 2019;14(11):1–12.

[14]. Fajriani, May,. & Khoiroh Muflihatin S. Hubungan Efikasi Diri dengan Manajemen Diri pada Penderita DM Tipe II di Wilayah Kerja Puskesmas Palaran Kota Samarinda. Borneo Student Res. 2021;2(2):994–1001.

[15]. Eroglu N, Sabuncu N. The effect of education given to type 2 diabetic individuals on diabetes self-management and self-efficacy: Randomized controlled trial. Prim Care Diabetes. 2021;15(3):451–8.

[16]. Van Der Bijl JJ, Van Poelgeest-Eeltink A, Shortridge-Baggett L. The psychometric properties of the diabetes management self-efficacy scale for patients with type 2 diabetes mellitus. J Adv Nurs. 1999;30(2):352–9.

[17]. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures. Spine (Phila Pa 1976). 2000;25(24):3186–91.

[18]. Guilford, J. P., Christensen, N. A., Bond, N. A. and Sutton MA. A Factor Analysis Study of Human Interests. Psychol Monogr Gen Appl. 1954;68(4):375.

[19]. Yusoff MSB. ABC of Content Validation and Content Validity Index Calculation. Educ Med J. 2019;11(2):49–54.

[20]. Lynn MR. Determination and Quantification Of Content Validity. Nurs Res. 1985;35(6):382–6.

[21]. Williams B, Onsman A, Brown T. Exploratory factor analysis: A five-step guide for novices Mr. J Emerg Prim Heal Care. 2010;8(3):1–13.

[22]. Dale Hill B. The Sequential Kaiser-Meyer-Olkin Procedure As An Alternative For Determining The Number Of Factors In Common-Factor Analysis: A Monte Carlo Simulation. Vol. 3, UMI Disertation Publishing. 2007.

[23]. Costello AB. Best-Practices-in-Exploratory-Factor-Analysis-Four-Recommendations-for-Getting-the-Most-From-Your-Analysis.pdf. Pan-Pacific Manag Rev. 2009;12(2):131–46.

[24]. Jordan P, Spiess M. Rethinking the Interpretation of Item Discrimination and Factor Loadings. Educ Psychol Meas. 2019;79(6):1–30.

[25]. Iskamto D, Ghazali PL, Aftanorhan A, Jenita, Sukono, Bon AT. Exploratory factor analysis (Efa) to measure entrepreneur satisfaction. Proc Int Conf Ind Eng Oper Manag. 2020;0(August):2585–93.

[26]. Sturt J, Hearnshaw H, Wakelin M. Validity and reliability of the DMSES UK: A measure of self-efficacy for type 2 diabetes self-management. Prim Heal Care Res Dev. 2010;11(4):374–81.

[27]. Kaiser HF, Rice J. Little Jiffy, Mark Iv. Educ Psychol Meas. 1974;34(1):111–7.

[28]. Hair JR JF, Black WC, Babin BJ, Anderson RE. Multivariate Data Analysis (7th Edition). 2010. 117 p.

[29]. Comrey AL, Lee HB. A First Course in Factor Analysis Second Edition. 2016. 1–23 p.

[30]. Mondiana YQ, Pramoedyo H, Sumarminingsih E. Structural Equation Modeling on Likert Scale Data With Transformation by Successive Interval Method and With No Transformation. Int J Sci Res Publ. 2018;8(5):398–405.

The Validity and Reliability of The Indonesian Version of Diabetes Mellitus Self Efficacy Scale

ORIGINALITY REPORT

15%	14%	9%	15%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.scribd.com Internet Source	6%
2	Submitted to SDM Universitas Gadjah Mada Student Paper	3%
3	Submitted to fpptijateng Student Paper	2%
4	www.ieomsociety.org Internet Source	2%
5	journals.lww.com Internet Source	2%

Exclude quotes	On	Exclude matches	< 2%
Exclude bibliography	On		

The Validity and Reliability of The Indonesian Version of Diabetes Mellitus Self Efficacy Scale

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12