Original Article

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Psychometric Properties of the Indonesian Version of the Medical Outcome Study Social Support Survey (MOS_SSS)

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ABSTRACT

Background: Patients with diabetes need to consider social support as an essential aspect that affects their function and well-being. A standardized instrument to assess social support is necessary, as this support plays a crucial role in blood sugar control. One such measurement tool is the Medical Outcome Study Social Support (MOS_SSS). At the same time, it does not yet exist in Indonesia, especially in diabetic patients. **Objectives:** This study aimed to conduct cross-cultural adaptation and psychometric testing of the MOS SSS into Indonesian. **Methods:** The researcher employed a cross-sectional design, incorporating a cultural adaptation approach, forward-backward translation, and psychometric testing. The total sample consists of 277 participants, divided into three groups: expert adjustment with seven experts, 36 respondents in pretesting, and 234 respondents in psychometric tests. **Results:** The Indonesian MOS_SSS has an I_CVI of 0.97, an S_CVI/UA of 0.81, an S_CVI/AVE of 0.97, and a Cronbach's alpha of 0.895–0.954. The researcher employed Exploratory Factor Analysis (EFA) to identify the factors created, and three factors were found: information and emotion, positive social interaction, and tangible support. The loading factor is 0.506–0.741 with 19 items. **Conclusion:** The MOS SSS Indonesian version is a valid and reliable instrument. The healthcare workers, especially nurses, could utilize it to assess social support for individuals with type 2 diabetes mellitus.

Keywords: Cross-Cultural Adaptation; Medical Outcome Study; Psychometric Test; Social Support Survey; Type 2 Diabetes Mellitus

INTRODUCTION

Diabetes mellitus is a chronic metabolic disease that is common in older adults and requires long-term care and high costs (Munshi *et al*., 2016). A person with diabetes must make healthy lifestyle changes. Therefore, ongoing support and professional diabetes care are required to maintain and adhere to these healthy lifestyle changes (Schmidt *et al.*, 2020).

Patients with chronic diseases, such as diabetes, should consider social support an essential aspect affecting their functioning and overall well-being (Sherbourne & Stewart, 1991). Social support could come from family, friends, relatives, and health workers. Family support positively impacts healthy eating habits, self-efficacy, perceptions of support, glycemic control, and psychological well-being (Adhikari *et al*., 2021). Having support from family is essential in managing their illness (Song *et al*., 2017). Family members could remind them when it is time to take medication, check their blood sugar, or see a doctor, among other tasks (Osborn & Egede, 2010). In addition to the support of health workers, they will provide health education, including blood sugar monitoring, diet, exercise, and consultation (Qiyun & Yuting, 2024).

A systematic review of 12 articles proves that Diabetes Self-Management Education (DSME) and peer support effectively reduce HbA1C levels (Azmiardi *et al*., 2021). Another study suggests that social support is associated with self-management, fasting blood sugar levels, quality of life (Qi *et al*., 2021), and glycemic control (Salinas-rehbein & Ortiz, 2024). This social support is essential for glycemic control in people with diabetes (Adu *et al*., 2024), so a standardized instrument is needed to measure social support. One of the questionnaires is the MOS_SSS. This questionnaire has been translated into various languages, such as

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Chinese, Malaysian, Iranian, Arabic, Austrian, Swedish, and Turkish.

Research Gap

At the same time, it does not yet exist in Indonesia, especially for people with diabetes. Therefore, the researcher is interested in translating it into Indonesian to help nurses assess diabetes social support.

METHODOLOGY

Study Design

The researcher used a cross-sectional design with a cultural adaptation approach, utilizing forward and backward translation (Qamar & Ibrahim, 2024).

Setting and Participants

In this study, participants are categorized into three groups: expert adjustment with seven experts, pretesting with 36 people, and a psychometric test with 234 type 2 DM patients, who were adults, could speak Indonesian, and did not have communication and mental disorders according to the doctor's diagnosis. Researchers used experts from various fields to determine the Content Validity Index (CVI), including psychologists, nutritionists, English language experts, and nurses. In the pretesting stage, data were collected at the clinic of a private hospital in Bantul, and in the psychometric stage, at Bantul and Kalasan.

Instrument: MOS_SSS

This instrument was developed by Sherbourne and Stewart (1991) in San Francisco, United States, with a Cronbach's alpha of >0.91. The Psychometric Properties of the Indonesian Version of the MOS_SSS instrument consisted of 20 questions, 19 of which had answer options of "never," "rarely," "sometimes," "often," and "always." Answers were scored using a 1-5 Likert scale. Social motivation scored the highest at 95 and the lowest at 5. One open-ended question asked about the number of close friends or relatives with whom one usually confided.

Study Procedure

The researcher sought permission from the instrument developer before starting the study. An English translator (T1), a nurse with clinical expertise in medical-surgical nursing, and 21 years of experience teaching nursing (T2) collaborated to translate MOS SSS into Indonesian. The translators both concurred on the result. Two independent English translators translated the Indonesian version back into English (BT1 & BT2). Before the expert review stage, the researchers compared their results with the original version. After obtaining the

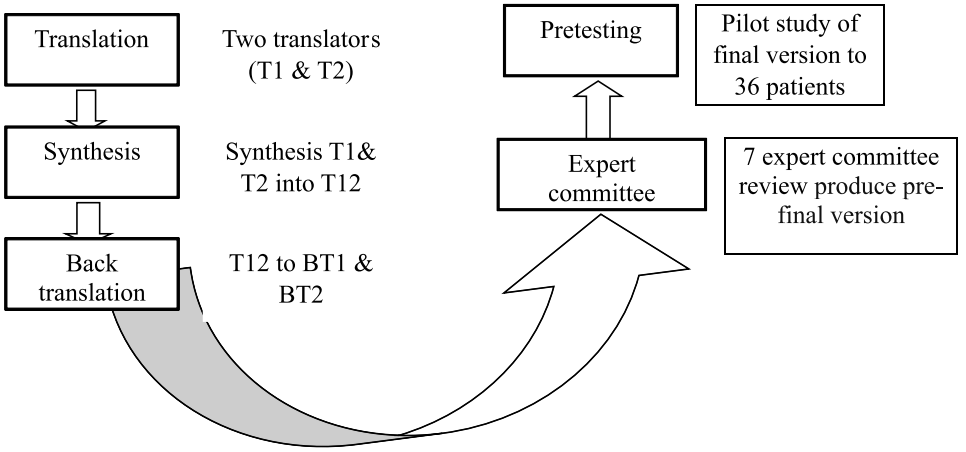

Figure 1:Translation Process

The experts assessed the level of relevance, accuracy, clarity, and ease of understanding. Each question on

the instrument was assigned a score by the expert committee ranging from 1 to 4, where 1 represented irrelevant content and 4 represented highly relevant content. The specialists made recommendations for already-existing goods and assessed whether any changes or eliminations were necessary (Figure 1).

Validation Process

The researchers used recognized methods to identify the patients. The study was conducted in three stages: an expert review, a pretest, and a psychometric test. The first stage was expert review. This step aims to produce a pre-final translation. The second stage was pretesting. This step aimed to evaluate respondents' clarity and ease of understanding of the questions. Pretesting was conducted on 36 diabetic patients selected from the internal medicine clinic at a private hospital.

The third stage was psychometric testing. The researchers used data from 234 internal medicine outpatient clinic patients for psychometric testing. Researchers collected data according to inclusion and exclusion criteria from April 22 to July 23, 2022. Researchers used standard methodology in determining the number of subjects with a subject-to-item ratio of ≥10:1 (Osborne & Costello, 2004).

Data Analysis

The reseacher used SPSS version 21 for analysis of EFA, Cronbach'alpha and KMO. The Amos 25 version was used for CFA analysis.

Validity of Content

The Indonesian version of the Medical Outcome Study Social Support (MOS_SSS_I) was evaluated for content validity using the "item content validity index" (I_CVI) and "scale content validity index" (S_CVI). The I_CVI, also known as (agreed item)/(number of experts), is the percentage of the content that the experts assign a relevance score of three or four. The experts graded the aspects on a 4-point scale, where a score of 1 was considered irrelevant, and a score of 4 was considered highly relevant. The scores are classified into two groups: relevant (scores 3 and 4) and irrelevant (scores 1-4) (Yusoff, 2019). The CVI value for seven expert reviewers is at least 0.78 (Lynn, 1985).

Validity of the Construct

The construct validity of MOS_SSS_I was assessed using "Confirmatory Factor Analysis" (CFA) and EFA. The criteria considered acceptable for construct validity are "Kaiser Meyer Olkin" (KMO) reaching 0.6, a relevant Bartlett's Sphericity Test at 0.05, and eigen values >1. The factor loading item is less than 0.3 (Comrey & Lee, 2020; Costello & Osborne, 2005) and will be eliminated.

Reliability

The researcher used Cronbach's alpha coefficient to assess reliability. The acceptable Cronbach's alpha coefficient value is >0.70 (Taber, 2018).

Ethical Considerations

The researchers obtained ethical approval from the Health Research Ethics Subcommittee of Panti Rapih Hospital, Indonesia, with reference number 13/SKEPK-KKE/IV/2022, from 13th April, 2022 to 12th April, 2023.

RESULTS

This study aims to translate the MOS_SSS questionnaire into Indonesian so that it can be easily used by nurses. The validation results confirm that the translated instrument adequately captures the multidimensional aspects of social support relevant to diabetes care, aligning with the theoretical importance highlighted in the introduction. The researchers presented their findings based on statistical analysis of a total of 277 respondents with diabetes mellitus.

Participant Characteristics

The researchers included 36 and 234 respondents in stages one and two, respectively. Initial stage characteristics include an age of 59±10.89 years, a BMI of 23.65±4.01, a blood sugar level of 159.69±50.80 mg/dL, and a gender distribution of 13 males (36.11%) and 23 females (63.89%).

Table 1: Characteristics of Respondents

Characteristics	Phase I (n=36)	Phase II (n=234)
	Mean ± SD	
Age (year)	59 ± 10.89	57.87 ±12.04
Body Height (cm)	161.36 ± 6.28	158.72 ± 13.34
Body Weight (kg)	61.78 ± 12.25	61.52 ± 13.29
BMI (Body Mass Index)	23.65 ± 4.01	24.35 ± 5.50
Blood Glucose Levels (mg/dL)	159.69 ± 50.80	189.58 ± 80.36
	n (%)	
Sex		
Male	13 (36.1)	111 (47.43)
Female	23 (63.9)	123 (52.56)
Ethnicity		
Javanese	(100)	234 (100)

Phase 1: initial phase, Phase II: psychometric testing, SD=Standard Deviation.

Table 1 presents the characteristics of the respondents, including their age at stage 2: 57.87 ± 12.04 years; BMI: 24.35 ± 5.50; blood sugar: 189.58 ± 80.36 gr/dL and a ratio of 111 men (47.43%) to 123 women (52.6%).

Content Validity

The findings of the expert review regarding the language's precision, readability, accuracy, and applicability for the MOS_SSS. The content validity of MOS_SSS_I is I_CVI=0.97, S_CVI/UA=0.81 and S_CVI/AVE=0.97. The MOS SSS_I is content-valid. All questions in this instrument were clear, accurate, and easily understood by the Indonesian respondents. The reviewer did not give any special notes on the question items.

The CFA results (CFI= 0.943, TLI= 0.934, RMSEA= 0.077) confirmed the three-factor model identified by EFA, consistent with the methodological criteria (KMO > 0.6 and eigenvalue > 1).

Construct Validity

The researcher used EFA to determine the factors formed. The EFA results revealed three factors: social, physical, and psychological motivation factors. The loading factor ranges from 0.188 to 0.741. The item with the lowest factor loading is item 1.

Table 2: The EFA of MOS_SSS_I (Indonesian Adaptation)

No	Item	Factor		
		Factor 1 (Emotional & Informational Support)	Factor 2 (Tangible Support)	Factor 3 (Positive Social Interaction)
1	Berapa banyak teman dan kerabat dekat yang Anda miliki (orang yang Anda rasa nyaman dan dapat diajak bicara tentang apa yang ada di pikiran Anda?[How many close friends and family members do you have (people you feel comfortable with and can talk to about what's on your mind)]?	0.188		
2	Seseorang yang membantu Anda ketika Anda tidak bisa beranjak dari tempat tidur [Someone who helps you when you can't get out of bed.]		0.627	
3	Seseorang yang dapat Anda andalkan untuk mendengarkan Anda ketika Anda perlu teman bicara [Someone you can rely on to listen to you when you need someone to talk to.]	0.611		
4	Seseorang yang memberi Anda nasihat ketika kesulitan [Someone who gives you advice when you're facing difficulties.]	0.684		
5	Seseorang yang membawa Anda ke dokter ketika Anda membutuhkannya [Someone who takes you to the doctor when you need it.]		0.705	

6	Seseorang yang menunjukkan cinta dan kasih sayang [Someone who shows you love and affection.]		0.691	
7	Seseorang untuk menghabiskan waktu bersama [Someone to spend time with.]		0.595	
8	Seseorang yang memberi Anda bantuan untuk memahami situasi [Someone who helps you understand the situation.]	0.663		
9	Seseorang sebagai tempat curhat dan berbicara tentang diri Anda atau masalah Anda [Someone to confide in and talk about yourself or your problems.]	0.686		
10	Seseorang yang memeluk Anda [Someone who gives you a hug.]	0.529		
11	Seseorang untuk berkumpul bersama untuk relaksasi [Someone to gather with for relaxation.]	0.506		
12	Seseorang yang menyiapkan makanan ketika Anda tidak dapat melakukannya sendiri [Someone who prepares food for you when you can't do it yourself.]		0.515	
13	Seseorang yang nasihatnya sangat Anda inginkan [Someone whose advice you truly want.]	0.599		
14	Seseorang untuk melakukan sesuatu bersama yang membantu Anda mengalihkan pikiran dari berbagai hal [Someone to do something together that helps you distract your mind from various things.]	0.656		
15	Seseorang yang membantu kegiatan sehari-hari ketika Anda sakit [Someone who helps with daily activities when you're sick.]		0.634	
16	Seseorang untuk berbagi kekhawatiran dan ketakutan paling pribadi Anda [Someone to share your most personal worries and fears with.]	0.696		
17	Seseorang untuk dimintai saran tentang bagaimana menangani masalah pribadi [Someone to ask for advice on how to handle personal problems.]	0.725		
18	Seseorang untuk melakukan sesuatu yang menyenangkan bersama [Someone to do something fun together.]			0.658
19	Seseorang yang memahami masalah Anda [Someone who understands your problems.]			0.622
20	Seseorang untuk dicintai dan membuat Anda merasa diinginkan [Someone to love and make you feel wanted.]			0.741

Factor 1 (Emotional & Informational); Factor 2 (Tangible Support); Factor 3 (Positive Social Interaction)

The factor loadings of MOS_SSS_I ranged from 0.188 to 0.741, which were divided into three factors. The first factor consists of ten emotional and informational items. The second factor comprises six tangible support items, and the third comprises four items related to positive social interaction Table 2.

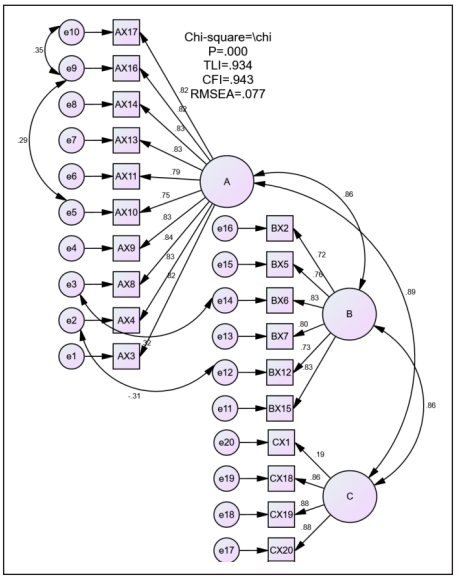

Figure 2: The CFA of MOS_SSS_I (result from Amos 25 version)

"TLI= Tucker-Lewis index, CFI= comparative fit index, RMSEA= root mean square approximation error". A=aspect emotional and informational, B= aspect tangible support, C= aspect positive social interaction, X1-X20=item.

Researchers used a "confirmatory factor analysis" (CFA) to validate the EFA. CFA obtained chi-square

with p=0.000, "Tucker-Lewis Index" (TLI) = 0.934, "Comparative Fit Index" (CFI)= 0.943, and "Root Mean Square Error of Approximation" (RMSEA)= 0.077. All items have $p > 0.05$, and the RMSEA value is less than 0.08, indicating that the model fits the data well in three aspects (Figure 2).

Reliability

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.958**
Bartlett's Test of Sphericity	Approx. Chi-Square	3962.158
	df	190
	Significance	0.000

The MOS_SSS_I instrument, with 20 question items, has a Cronbach's alpha of 0.856, and if one item is deleted, the Cronbach's alpha is 0.867. A KMO value = 0.958 suggests that factor analysis can be performed. The $p < 0.000$ shows that Bartlett's sphericity test is significant (Table 3).

DISCUSSION

The researcher used EFA to identify possible factor structures. After obtaining the factors, the researchers then conducted confirmatory factor analysis. CFA is primarily used to confirm that the structure of a psychometric test aligns with theoretical expectations, verifying that items group together as intended to measure specific constructs. The EFA yielded three factors. These three factors are presented as a fit model with results CFI=0.943, TLI=0.934, and RMSEA=0.077 (Comrey & Lee, 2020).

The loading factor for item 1 is 0.188. This item inquires about the number of close friends or relatives with whom the respondent could discuss their thoughts and feelings, rather than inquiring about the level of support they receive (Sherbourne & Stewart, 1991). The researcher did not remove this item because it is important and relevant to the other items. Item 1 asks about the number of close friends, not about how much motivation others provide. The more close friends you have, the more motivation you receive.

The three factors of MOS_SSS_I are emotional and informational, tangible support, and positive social interaction. The results of this study show that emotional factors and information are one factor, unlike the original version (Sherbourne & Stewart, 1991). Informational support is the provision of advice, suggestions, or facts to help solve problems, while emotional support is the expression of concern, empathy, and affection to help someone feel supported and not alone. In Indonesian culture, these two aspects are interrelated. When someone cares, they will provide all the information the patients need. Indonesian society provides information and support simultaneously, so these two aspects cannot be separated.

Tangible support refers to the provision of practical, material, or physical assistance to someone in need. This includes help with daily chores, financial aid, transportation, or services such as caregiving. Tangible support is concrete and direct, aiming to address specific practical needs. For example, someone driving you to a doctor's appointment or helping with household tasks when you are ill is a form of tangible support. Positive social interaction is the degree to which an individual has opportunities to engage in enjoyable, fun, or relaxing activities with others. It reflects the availability of companions for leisure, recreation, or simply having a good time. This type of support emphasizes companionship and shared enjoyment, such as having someone to talk to, laugh with, or share hobbies together (Pillemer & Holtzer, 2017).

Indonesian society is highly collectivist, emphasizing close family ties, group harmony, and mutual support. Social support is most often experienced through family and close-knit social networks, where positive interactions naturally include expressions of affection, care, and emotional warmth. In practice, positive social interactions in Indonesia almost always involve affectionate gestures, such as caring words, physical closeness, and emotional reassurance, making it difficult to separate the two constructs. In Asian contexts, including Indonesia, emotional and affectionate support are the most commonly measured and impactful forms of functional social support. These forms are closely linked to positive social interaction, as both serve to reduce stress, enhance well-being, and foster a sense of belonging (Mohd *et al.*, 2019).

Figure 2 illustrates a sufficient loading factor on emotional and informational aspects, which exceeds 0.5. The emotional and informational aspects of close friends and family greatly support patients in managing their

illness (Pérez-fernández *et al.*, 2021). Support from family or close friends in helping with check-ups, preparing meals, and accompanying the patient could foster confidence, improve treatment compliance, and enhance glycemic control (Busebaia *et al.*, 2023). The emotional and informational tangible support and positive social interaction factors have a strong correlation (Figure 2).

Cronbach α coefficients for the MOS-SSS Chinese version were 0.91 for the overall scale and 0.71 to 0.84 for the four subscales, indicating an adequate level of internal consistency (Wang *et al*., 2013). The Portuguese MOS's overall scale has a Cronbach's alpha of 0.95, whereas the five sub-scales that the original instrument suggested had values ranging from 0.78 to 0.87 (Soares *et al*., 2012). According to Robitaille *et al*. (2011), the French MOS results showed reliability of 0.93 to 0.97 and Cronbach's alpha of 0.90 to 0.97 for all dimensions of functional social support.

Social support contributes 24% to diabetes self-care and 49% to the quality of life of patients with diabetes (Jafari *et al*., 2024). Social support affects self-efficacy (Bandhu *et al*., 2024). Individuals with good social support and self-efficacy tend to positively impact treatment adherence (Azar *et al*., 2024). Social support also affects sleep quality. Social support makes people feel safe and comfortable, enabling them to enjoy quality sleep (Mirzaei *et al.*, 2025). Compared with other studies, the reliability and validity of MOS_SSS_I are almost similar. The results prove that the MOS_SSS questionnaire is relevant in various countries.

Practical Implications

Health workers, especially nurses, are facilitated by instruments in Indonesia. Nurses could easily assess social support for patients, particularly those with diabetes. Nurses could use this instrument to measure social support in people with diabetes mellitus. This social support plays an essential role in diabetes management behavior. By understanding the social support patients receive, nurses could provide more effective follow-up care for their diabetes management.

Limitations

Respondents in this study were limited to two suburban private hospitals. It would be better if the characteristics of respondents varied between urban and rural areas so that they could represent all diabetic patients. Additionally, this study did not assess concurrent validity. A suggestion for future researchers is to involve respondents from both urban and rural areas, thereby reflecting more comprehensive cultural characteristics.

CONCLUSION

The Indonesian version of the Medical Outcome Study Social Support Survey (MOSS_SS) demonstrates strong psychometric properties and is a reliable and valid instrument for measuring perceived social support among Indonesian populations. The scale shows excellent internal consistency across its subscales, emotional and informational, tangible support, and positive social interaction, indicating that the items consistently measure their intended constructs. Confirmatory factor analysis provides evidence of good model fit, supporting the instrument's original multidimensional structure.

Furthermore, the Indonesian MOSS_SS exhibits satisfactory construct validity, convergent and discriminant validity, and is culturally appropriate for use in diverse clinical and community settings. Overall, the Indonesian MOSS_SS is a robust tool for assessing social support and can be confidently applied in research, public health, and clinical practice in Indonesia.

The instrument can support collaboration between physicians, nurses, psychologists, and social workers by providing standardized data on a patient's social environment. This facilitates more holistic care, particularly for patients with chronic illnesses, mental health conditions, or limited family support. Future research should investigate how each MOS_SSS_Isubscale relates to clinical markers, treatment adherence, psychological resilience, and quality of life. These findings would deepen understanding of the mechanisms through which social support influences health.

Conflict of Interest

The author declares no competing interests.

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REFERENCES

Adhikari, M., Devkota, H. R., & Cesuroglu, T. (2021). Barriers to and facilitators of diabetes self-management practices in Rupandehi, Nepal- multiple stakeholders' perspective. *BMC Public Health, 21*, 1269. https://doi.org/10.1186/s12889-021-11308-4

Adu, F. A., Poku, C. A., Adu, A. P., & Owusu, L. B. (2024). The role of social support and self-management on glycemic control of type 2 diabetes mellitus with complications in Ghana: A cross-sectional study. *Health Science Reports, 7*(4), e2054. https://doi.org/10.1002/hsr2.2054

Azmiardi, A., Murti, B., Febrinasari, R. P., & Tamtomo, D. G. (2021). The effect of peer support in diabetes self-management education on glycemic control in patients with type 2 diabetes : Meta-analysis. *Epidemiology and Health, 43*, 1–10, e2021090. https://doi.org/10.4178/epih.e2021090

Bandhu, D., Mohan, M. M., Anurag, N., Nittala, P., Jadhav, P., Bhadauria, A., & Saxena, K. K. (2024). Acta Psychologica Theories of motivation : A comprehensive analysis of human behavior drivers. *Acta Psychologica, 244*(February), 104177. https://doi.org/10.1016/j.actpsy.2024.104177

Busebaia, T. J. A., Thompson, J., Fairbrother, H., & Ali, P. (2023). The role of family in supporting adherence to diabetes self- care management practices : An umbrella review. *Journal of Advanced Nursing, 79*(10), 3652–3677. https://doi.org/10.1111/jan.15689

Comrey, A. L., & Lee, H. B. (2020). *A first course in factor analysis* (2nd ed., Vol. 5, Issue 3). Psychology Press, New York. https://doi.org/10.4324/9781315827506

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation, 10*(7), 1-9. https://doi.org/10.7275/jyj1-4868

Jafari, A., Naddafi, F., Aval, M. G., & Tehrani, H. (2024). Relationship between diabetes health literacy , distress , burnout , social support , complications , self-care behaviors , and quality of life among patients with type 2 diabetes: A path analysis study. *Diabetology & Metabolic Syndrome, 16*, 1–14, 150. https://doi.org/10.1186/s13098-024-01391-z

Lynn, M. R. (1985). Determination and quantification of content validity. *Nursing Research, 35*(6), 382–386. https://doi.org/10.1097/00006199-198611000-00017

Mirzaei, M., Sharifi, M. H., Mahboobi, S., Karimi, M., & Eftekhari, M. H. (2025). The relationship between glycemic index , social support and sleep quality in patients with type 2 diabetes. *International Journal of Nutrition Sciences, 10*(2), 126–135. https://doi.org/10.30476/ijns.2025.100845.1286

Munshi, M. N., Florez, H., Huang, E. S., Kalyani, R. R., Mupanomunda, M., Pandya, N., Swift, C. S., Taveira, T. H., & Haas, L. B. (2016). Management of diabetes in longterm care and skilled nursing facilities: A position statement of the American diabetes association. *Diabetes Care, 39*(2), 308–318. https://doi.org/10.2337/dc15-2512

Osborn, C. Y., & Egede, L. E. (2010). Validation of an information-motivation-behavioral skills model of diabetes self-care (IMB-DSC). *Patient Education and Counseling, 79*(1), 49–54. https://doi.org/10.1016/j.pec.2009.07.016

Osborne, J. W., & Costello, A. B. (2004). Sample size and subject to item ratio in principal components analysis. *Practical Assessment, Research and Evaluation, 9*(11), 1–9. https://doi.org/10.7275/ktzq-jq66

Pérez-fernández, A., Fernández-berrocal, P., & Gutiérrez-Cobo, M. J. (2021). The relationship between emotional intelligence and diabetes management: A systematic review. *Frontier in Psychology, 12*, 1–13, 754362. https://doi.org/10.3389/fpsyg.2021.754362

Pillemer, S. C., & Holtzer, R. (2015). The differential relationship of dimensions of perceived social support with cognitive function among older adults. *Aging and Mental Health., 20*(7), 727–735. https://doi.org/10.1080/13607863.2015.1033683

Qamar, T., & Ibrahim, N. (2024). Guidelines for the process of cross-cultural adaptation and translation of therapeutic modules. *Journal of Ayub Medical College Abbottabad, 36*(4), 681-685. https://doi.org/10.55519/JAMC-04-13584

Qi, X., Xu, J., Chen, G., Liu, H., Liu, J., Wang, J., Zhang, X., Hao, Y., Wu, Q., & Jiao, M. (2021). Self - management behavior and fasting plasma glucose control in patients with type 2 diabetes mellitus over 60 years old : Multiple effects of social support on quality of life. *Health and Quality of Life Outcomes, 19,* 1–15, 254. https://doi.org/10.1186/s12955-021-01881-y

Qiyun, Z., & Yuting, Y. (2024). Describe the experience of patients with type 2 diabetes: A descriptive review. *Lishui University, China*. https://www.diva-portal.org/smash/get/diva2:1862037/FULLTEXT01.pdf

Robitaille, A., Orpana, H., & Mcintosh, C. N. (2011). Psychometric properties , factorial structure , and measurement invariance of the English and French versions of the Medical Outcomes Study social support scale. *Health Report, 22*(2), 33–40. https://www150.statcan.gc.ca/n1/en/pub/82-003-x/2011002/article/11437-eng.pdf?st=t1kNkk8D

Salinas-rehbein, B., & Ortiz, M. S. (2024). Perceived social support and treatment adherence in chileans with type 2 diabetes. *Journal of Health Psychology, 30*(5), 887-897. https://doi.org/10.1177/13591053241253370

Schmidt, S. K., Hemmestad, L., Macdonald, C. S., Langberg, H., & Valentiner, L. S. (2020). Motivation and barriers to maintaining lifestyle changes in patients with type 2 diabetes after an intensive lifestyle intervention (The U-TURN trial): A longitudinal qualitative study. *International Journal of Environmental Research and Public Health, 17*(20), 7454. https://doi.org/10.3390/ijerph17207454

Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social Science and Medicine, 32*(6), 705–714. https://doi.org/10.1016/0277-9536(91)90150-B

Soares, A., Biasoli, I., Scheliga, A., Baptista, R. L., Brabo, E. P., Morais, J. C., Werneck, G. L., & Spector, N. (2012). Validation of the Brazilian Portuguese version of the medical outcomes study-social support survey in Hodgkin's Lymphoma survivors. *Supportive Care in Cancer, 20*, 1895–1900. https://doi.org/10.1007/s00520-011-1292-8

Song, Y., Nam, S., Park, S., Shin, I. S., & Ku, B. J. (2017). The impact of social support on self-care of patients with diabetes: What is the effect of diabetes type? Systematic review and meta-analysis. *Diabetes Educator, 43*(4), 396–412. https://doi.org/10.1177/0145721717712457

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*, 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Tengku Mohd, T. A. M., Yunus, R. M., Hairi, F., Hairi, N. N., & Choo, W. Y. (2019). Social support and depression among community-dwelling older adults in Asia: A systematic review. *BMJ Open, 9*(7), e026667. https://doi.org/ 10.1136/bmjopen-2018-026667

Wang, W., Zheng, X., He, H. G., & Thompson, D. R. (2013). Psychometric testing of the Chinese Mandarin version of the Medical Outcomes Study social support survey in patients with coronary heart disease in Mainland China. *Quality of Life Research, 22*(8), 1965–1971. https://doi.org/10.1007/s11136-012-0345-x

Yusoff, M. S. B. (2019). ABC of content validation and content validity index calculation. *Education in Medicine Journal, 11*(2), 49–54. https://doi.org/10.21315/eimj2019.11.2.6