Jurnal Ners

Volume 19 Issue 4, Nov 2024, p. 459-468
http://dx.doi.org/10.20473/jn.v19i4.57107

ORIGINAL ARTICLE OPEN ACCESS

A pilot translation and adaptation of the Diabetes Obstacle Questionnaire (DOQ) to measure obstacles and challenges in diabetes management for people with diabetes in Indonesia

Niken Safitri Dyan Kusumaningrum[1]*, and Fitria Handayani[1]

[1] Department of Nursing, Universitas Diponegoro, Semarang, Indonesia

*Correspondence: Niken Safitri Dyan Kusumaningrum. Address: Department of Nursing, Universitas Diponegoro, Semarang, Indonesia Email: niken.safitridk@fk.undip.ac.id

Responsible Editor: Laily Hidayati

Received: 28 April 2024○ Revised: 5 September 2024 ○ Accepted: 14 November 2024

ABSTRACT

Introduction: Identifying the issues faced by Indonesians living with diabetes is crucial to address them appropriately. However, a standardized tool cannot measure the obstacles encountered in managing illness. Therefore, there is a need for widely accepted assessment tools to investigate these problems. This article explains the findings of the pilot translation and adaptation of the Diabetes Obstacle Questionnaire (DOQ) for people with diabetes in Indonesia.

Methods: The English version of the DOQ was cross-culturally adapted and translated into Bahasa, Indonesia. The completion of the questionnaire required approximately 30 min for each of the 61 respondents, all of whom were Indonesians diagnosed with diabetes. Factor analysis, product moment, and Cronbach's alpha were used in STATA SE 13.1 for data analysis.

Results: The original 78 items underwent a systematic process of translation and adaptation to align with the Indonesian context. Twenty-one items were eliminated, leaving 57 valid question items following a judgement of expert and statistical analysis. The reliability coefficient of the Indonesian version of the DOQ was acceptable, with a value of 0.96 for all items. The coefficient varied between 0.82 and 0.99 for different scales, indicating high internal consistency reliability.

Conclusions: The Indonesian version of the 57-item DOQ is an acceptable instrument that can be used to identify obstacles faced by people with diabetes in Indonesia. This can facilitate researchers in investigating the problems faced by those living with diabetes in managing their condition.

Keywords: adaptation, diabetes management, questionnaire, translation

Introduction

Diabetes mellitus (DM) is a chronic metabolic condition characterized by excessive levels of blood glucose caused by beta-pancreas deterioration, which eventually causes catastrophic damage to vital organs, including the heart, blood vessels, eyes, kidneys, and nerves (Chatterjee, Khunti and Davies, 2017; Punthakee, Goldenberg and Katz, 2018; Egan and Dinneen, 2019; World Health Organization (WHO), 2023). This condition is one of the major health issues in which long-life suffering has reached alarming levels. According to the most recent projections, general diabetes in Indonesia will grow by over 7% between 2020 and 2045, from 18.69 million cases to 40.7 million (Wahidin *et al.*, 2024). The mortality rate of type 2 diabetes mellitus (T2DM) has increased by 13% in lower-middle-income countries between 2000 and 2019, even though the probability of

dying from other non-communicable diseases has decreased (WHO, 2023).

Globally, the International Diabetes Federation (IDF) states that more than one in 10 adults is living with diabetes, and Indonesia has the highest proportion of undiagnosed diabetes (IDF, 2021; Tanoey and Becher, 2021). Newly diagnosed people living with diabetes face several challenges, not only physically but also psychologically, such as emotional disturbances, fear, anger, denial, frustration, depression, and uncertainty (Krishna, 2018; Arifin, van Asselt, *et al.*, 2019; Rariden, 2019). In addition, the direct and indirect costs of diabetes also limit access to healthcare services (Soewondo, Ferrario and Tahapary, 2013; Patty, Mufarrihah and Nita, 2021). Moreover, a meta-synthesis indicated that living with T2DM presents several obstacles in all parts of everyday life and across all dimensions of life, including physical, social, emotional, and spiritual (Inga-Britt and Kerstin, 2018). People living with this endocrine disorder often experience multiple problems.

Understanding the problems experienced by people with diabetes is essential. However, these issues remain unclear. Moreover, exploring people with diabetes and their experiences of living with diabetes is challenging. People with diabetes may have difficulty expressing their feelings even if they are unaware of their exact issues (Kalra, Jena and Yeravdekar, 2018). Bhagavathula *et al.* (2018) reported that people living with diabetes in Ethiopia face several obstacles related to relationships with health providers, a lack of support from their friends, a lack of knowledge about diabetes, and a lack of motivation to exercise. Mwila et al. (2019) emphasized that some adults living with T2DM in Zambia experienced physical sickness; mental ailments; poor family support and adherence; and inadequate information, education, and communication.

In Indonesia, people with diabetes act only after they have received recommendations that they consider trustworthy (Ligita *et al.*, 2019). Additionally, an important finding in Indonesia explains the potential diabetes distress associated with healthcare delivery and the unique obstacles experienced by housewives diagnosed with T2DM (Arifin, Probandari, *et al.*, 2019). Studies on the obstacles faced by patients regarding diabetes management in Indonesia are scarce, leaving a gap that needs to be addressed. However, Suastika *et al.* (2022) reported that experts noted that Indonesians with T2DM have unhealthy lifestyle habits such as smoking, excessive alcohol consumption, and insufficient sleep.

Standardized instruments to measure the obstacles faced by patients with diabetes in managing their illness are limited. One widely used instrument in diabetes research is the Diabetes Obstacles Questionnaire (DOQ), which was specifically developed and rigorously validated for use among the English-speaking population in the United Kingdom (Hearnshaw *et al.*, 2007). Moreover, the short version of this questionnaire, called the DOQ-30, was studied in six European countries, including Belgium, France, Estonia, Serbia, Slovenia, and Turkey (Pilv *et al.*, 2016). A globally accepted translated instrument would be useful in investigating the obstacles experienced by individuals with diabetes in Indonesia. Therefore, this study aimed to translate and adapt the Indonesian version of the DOQ into an appropriate instrument to assess the obstacles faced by people with diabetes in managing their condition.

Materials and Methods

Design and samples

This pilot translation and adaptation study was conducted in two public health centers that reported the highest number of people with diabetes in Semarang, Central Java, to assess the challenges experienced by people with diabetes in managing their condition. Healthcare and linguistic professionals were invited to validate the instrument, while people with diabetes registered in the public health centers' medical records were recruited to participate in the pilot test of the instrument.

Measurement and data collection

Translation and adaptation process

In the first stage, the English version of the DOQ was translated into Bahasa Indonesia based on the guidelines for the cross-cultural adaptation of self-report measures (Beaton et al., 2000). Three independent experts, including a nurse and linguistic professional, conducted a forward translation from the original language (English) to the target language (Bahasa Indonesia). The questionnaire was then translated back into English to ensure that it represented the same item content as the original version. A native English speaker and a language professional without a health background produced back-translated documents with limited awareness of the concepts explored. Each translator was given an instrument and translation instructions.

After all translation processes were complete, the researchers consolidated all versions of the

questionnaire and prepared them for field testing. To address these discrepancies, thorough discussions were conducted and resolved with the input of researchers and three experts, including nurses and a psychologist, to uphold fidelity to the original concept.

The DOQ, which was developed in the UK and consists of 78 statements, is divided into eight scales: medication (10 items), self-monitoring (5 items), knowledge and beliefs (9 items), diagnosis (6 items), relationships with healthcare professionals (18 items), lifestyle changes (13 items), coping (8 items), and advice and support (8 items) (Hearnshaw et al., 2007). Responses are based on a five-point Likert scale labelled Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The author approved the permission to translate and adapt the DOQ via email.

Pilot test process

A pilot study was conducted consecutively on patients living with diabetes at two public health centers from February to May 2023. Individuals who were diagnosed with diabetes and registered in public health centers were approached either online or in person to participate in the study. Eligible patients were informed about the objectives and methods of the study. Participants filled out a paper or soft-file format of the Indonesian version of the DOQ, which lasted for approximately 20–30 minutes. Each participant was assisted by a pre-trained nurse to fill in the questionnaire.

Table 1. Socio-demographic characteristics and disease history of participants

Variable	n	%
Socio-demographic characteristics		
Age – years (min-max; mean; SD)	35-82; 60.57; 9.47	
Sex		
Male	15	27.78
Female	39	72.22
Level of education		
Low	18	33.33
Middle	26	48.15
High	10	18.52
Occupation		
Not working	35	64.81
Non-government employee	16	29.63
Government employee	3	5.56
Disease history		
Duration of diabetes - years (min-max; mean; SD)	0.25-45; 8.42; 7.73	

Data analysis

Data were statistically analyzed using STATA SE 13.1. Demographic characteristics were descriptively analyzed by presenting the frequency distribution, percentage, mean, and standard deviation.

To examine construct validity, eight factors were extracted using Principal Component Analysis (PCA),

Table 2. Component matrix

Factor	Variable	Coefficient correlation	Factor	Variable	Coefficient correlation
Medication	Medication 4	0.746	Relationships with Healthcare providers	HCP 1	0.758
	Medication 5	0.689		HCP 2	0.753
	Medication 7	0.730		HCP 3	0.754
	Medication 9	0.709		HCP 4	0.791
	Medication 10	0.836		HCP 5	0.753
				HCP 6	0.546
Self-monitoring	Self-monitoring 1	0.740		HCP 7	0.781
	Self-monitoring 2	0.840		HCP 8	0.681
	Self-monitoring 3	0.779		HCP 10	0.688
	Self-monitoring 4	0.803		HCP 11	0.655
	Self-monitoring 5	0.650		HCP 14	0.762
				HCP 15	0.709
Knowledge and beliefs	Knowledge and belief 1	0.820		HCP 16	0.680
	Knowledge and belief 2	0.641		HCP 17	0.617
	Knowledge and belief 3	0.814			
	Knowledge and belief 4	0.797	Lifestyle changes	Lifestyle changes 1	0.765
	Knowledge and belief 5	0.542		Lifestyle changes 2	0.673
	Knowledge and belief 6	0.787		Lifestyle changes 3	0.806
	Knowledge and belief 7	0.792		Lifestyle changes 4	0.668
	Knowledge and belief 9	0.755		Lifestyle changes 5	0.842
	Knowledge and belief 10	0.678		Lifestyle changes 6	0.756
				Lifestyle changes 7	0.705
Diagnosis	Diagnosis 3	0.816		Lifestyle changes 8	0.591
	Diagnosis 4	0.896		Lifestyle changes 13	0.677
	Diagnosis 5	0.787			
	Diagnosis 6	0.622	Coping with diabetes	Coping diabetes 1	0.681
				Coping diabetes 2	0.684
Advice and support	Support 1	0.550		Coping diabetes 3	0.804
	Support 3	0.710		Coping diabetes 4	0.846
	Support 6	0.712		Coping diabetes 5	0.797
	Support 7	0.788		Coping diabetes 8	0.557
	Support 8	0.835			

Table 3. The Diabetes Obstacles Questionnaire (Bahasa Indonesia version) result after analysis

DOQ scale	Items	% of variance explained	Kaiser-Meyer Olkin	Cronbach's alpha
Obstacles in medication	5	55.323	0.666	0.817
Obstacles in self-monitoring	5	58.56	0.797	0.862
Obstacles of knowledge and beliefs	9	55.013	0.85	0.915
Obstacles at diagnosis	4	61.85	0.734	0.844
Obstacles in Relationships with healthcare professionals	9	52.43	0.793	0.907
Obstacles to lifestyle changes	14	50.74	0.76	0.994
Obstacles to coping with diabetes	6	54	0.823	0.866
Obstacles around advice and support	5	52.61	0.675	0.839

each ranging from four to 18 indicators. The Kaiser-Meyer-Olkin (KMO) value was measured to indicate sampling adequacy in comparing the correlations and partial correlations between variables, and its result was used to determine the suitability of data for factor analysis (Kaiser and Rice, 1974). Additionally, face validity was considered to represent the construct to be measured. It relies on individuals' subjective assessments to determine if the measure being applied is appropriate (Bagby, Goldbloom and Schulte, 2006). Seven individuals with diabetes were asked about the readability and clarity of the Indonesian version of the DOQ.

Internal consistency is a measure of reliability that represents the extent to which items within an instrument measure distinct parts of the same trait or concept (Revicki, 2014). Cronbach's alpha was calculated to measure the scale's internal consistency, which reflects the degree of correlation between individual questionnaire items.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Medicine Universitas Diponegoro (No: 367/EC/KEPK/FK-UNDIP/X/2022). All methods of this study, which involved human research participants, were performed in accordance with the Declaration of Helsinki. All subjects, including their legal guardians, provided informed consent. Each participant signed a written consent form indicating their permission to participate in the study.

Results

The translation and adaptation of the DOQ into Bahasa Indonesia involved multiple steps. Seven individuals with diabetes participated in face validation of a paper-based questionnaire. This validation followed the detailed procedures outlined in the Methods section, and was conducted by researchers and experts. The participants stated that some of the questions were confusing and difficult to understand. They also specified that many questions and domains should be answered, which is time consuming. The time taken to complete the questionnaire was approximately 30 minutes. Responding to the participants' comments, minor corrections and fine-tuning of the questionnaire were performed by researchers to improve clarity before continuing the data collection.

All data from the questionnaires completed by participants were entered into the statistical software program. The sociodemographic characteristics and disease history of the participants are presented in Table 1. Among 220 documented cases of diabetes across the two public health centers, the participation rate was 27.73%. Of the 61 voluntary respondents who completed the questionnaire, 54 were included in the analysis. One participant answered the questions below 5% of the items, and six of them only partially completed the questionnaire (around 88% of the items), so they were omitted from the analysis.

The results showed that the age of participants ranged from 35 to 82 years, with a mean of 60.57 (SD=9.47) and more females (72.22%) than males participated in this study. More than half of the participants were not working (64.81%) and had a middle level of education (48.15%). The mean time of diabetes since they have been diagnosed was 8.42 years (SD=7.73), with the longest diagnosis of diabetes being 45 years.

The component matrix shows the correlation between each variable and identified factors. From the output of each factor, it can be seen that all included indicators met the minimal requirement correlation towards its factor between 0.5 and 1. The coefficient of the variables ranged from 0.542 to 0.896, where the closer it was to 1 of the component value matrices, the better the contribution. Therefore, these indicators are suitable for the application of these factors. The summarized correlation coefficients for each variable and factor are presented in Table 2.

The internal consistency reliability coefficient of the Indonesian version of the DOQ ranges from 0.839 to 0.994. These scores were above 0.80 on each scale which indicated a high reliability. A summary of the internal consistency reliability is presented in Table 3.

The validated DOQ retained 57 items in its final version. After expert judgment and statistical analysis,

Table 4. Details of the DOQ original items removed or adjusted to Indonesian versions

Original item	Adapted item	Rationale
Scale 1 - Obstacles in Medication		
Item 1: I do not feel I am being prescribed the medication that is right for me.	Deleted	In Indonesia, the patriarchal culture has resulted in a tendency for individuals to place considerable trust in healthcare providers when it comes to their medications.
Item 2: I do not feel I am being prescribed the medication dose that is right for me.	Deleted	Individuals or patients generally have limited awareness regarding the calculation of drug dosages.
Item 3: I don't know what to do about taking my medication when I am feeling unwell.	Deleted	Individuals or patients generally have limited awareness regarding the medication before they get severe conditions.
Item 6: People treat insulin users differently.	Deleted	This question is not significant as such cases are rarely found.
Item 8: I forget to take my medication.	Deleted	While this question is important, it can be confusing, whether they forget to take their medication at the appropriate time, yesterday, or in a frequent occurrence. In reality, patients often forget to take their medication because it needs to be consumed daily.
Scale 2 – Obstacles in Self-Monitoring	All items were included.	
Scale 3 – Obstacles of Knowledge and Belief		
Item 8: I believe type 2 diabetes is mild compared with type 1.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Scale 4 – Obstacles at Diagnosis		
Item 1: The way that I was told that I had diabetes made me feel confused.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 2: The way that I was told that I had diabetes made me feel afraid.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 3: The way that I was told that I had diabetes made me feel that it was not a serious condition.	Item 3: Change the order of the clause. *Saya merasa diabetes bukan kondisi yang serius karena cara tenaga kesehatan memberi tahu bahwa saya menderita diabetes ketika pertama kali.*	The sentence has been simplified for better understanding.
Item 4: The was that I was told that I had diabetes did not motivate me to manage my diabetes well.	Item 4: Change the order of the clause. *Saya tidak termotivasi untuk mengelola diabetes dengan baik karena cara tenaga kesehatan memberi tahu bahwa saya menderita diabetes ketika pertama kali.*	The sentence has been simplified for better understanding.
Item 6: The way that I was told that I had diabetes made me feel guilty.	Item 6: Change the order of the clause. *Saya merasa bersalah karena cara tenaga kesehatan ketika pertama kali memberi tahu bahwa saya menderita diabetes.*	The sentence has been simplified for better understanding.
Scale 5 – Obstacles in Relationships with Health Care Professionals		
Item 9: I do not feel I am part of the diabetes team.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 12: Talking about my diabetes with members of the diabetes team does not make me feel better.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 13: Adjustments to my diabetes plan cannot be discussed.	Deleted	In the realm of healthcare services, individuals are not given choices concerning the treatments that can be administered to them.
Item 18: I have to spend too much time waiting in clinics.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.

Original item	Adapted item	Rationale
Scale 6 – Obstacles to Lifestyle Changes		
Item 9: I am unable to afford the cost of exercising on a regular basis.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 10: I haven't found an exercise I enjoy.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 11: I lack the motivation to exercise.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 12: Weight control is real problem for me.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Scale 7 – Obstacles to coping with Diabetes		
Item 1: Self-management of diabetes is difficult to maintain because diabetes complications are not immediate.	Item 1: Rephrase. *Saya merasa tidak perlu merawat diri karena saya belum merasa adanya komplikasi diabetes.*	Individuals generally have limited awareness of their treatment until their condition becomes severe.
Item 6: I feel that I would like to take a holiday from my diabetes.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 7: I eat something I should not rather than I say have diabetes.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Scale 8 – Obstacles around Advice and Support		
Item 2: I am told too often what I should and should not be doing to manage my diabetes.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 4: I am criticized too often about the way I manage my diabetes.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.
Item 5: I would manage my diabetes much better if I had more encouragement socially.	Deleted	The statistical analysis indicates that the results are not deemed to be statistically significant.

21 items were excluded. The details outlining the specific items from the original DOQ that were either removed or adjusted in the Bahasa Indonesia version are comprehensively documented in Table 4.

Discussions

To the best of our knowledge, this is a comprehensive validation study in Indonesia that used the same analytical approach as the original UK study. Some items are eliminated because of local considerations, which are relatively different between developing countries and developed countries. For example, we deleted the questions related to medication and dose. In Indonesia, it is uncommon for patients to want to know details and manage their treatment due to patriarchal culture, which results in a tendency for individuals to place considerable trust in healthcare providers regarding their medications. Moreover, individuals or patients generally have limited awareness regarding the calculation of drug dosages.

In addition, certain conditions in Europe may not be applicable to Asia, particularly Indonesia. This includes the relationship between healthcare providers and patients as well as aspects related to lifestyle. Putri, et.al. (2020) discovered that healthcare providers noted that individuals living with diabetes in rural areas tend to exhibit poorer care-seeking behavior than their urban counterparts. Moreover, healthcare facilities are often limited, hindering the achievement of treatment goals for people with diabetes (Alkaff *et al.*, 2021).

The DOQ was translated and back translated during the first stage of the study. However, the duration of this step exceeded expectations as not all experts were contacted to confirm their approval to be involved in the process. This phase relies heavily on language proficiency and cultural acuity, which unfortunately deters some individuals from taking part due to time constraints or other factors. A previous study concerning this condition also stated that as globalization continues to elevate the significance of English in Indonesia, it is imperative that Indonesians feel empowered to assert themselves and engage with English speakers from all over the world on an equal level (Dewi, 2011).

This pilot survey involved patients with diabetes who were registered in the Chronic Diseases Management Program (*Program Pengelolaan Penyakit*

Kronis/PROLANIS), which is a program from BPJS Health (National Health Insurance) that aims to improve the quality of life of patients with chronic diseases. The participation rate is extremely low. Some conditions, such as patients' willingness to participate in research, are an ongoing problem often faced by health research investigators.

A previous study revealed that 25% of respondents confirmed that they would not be willing, and 29% stated that they were undecided regarding participation (Trauth *et al.*, 2000). In this study, demographic characteristics, such as education degree and age, were considered to have affected their decision to participate in the research. The mean age of the participants who voluntarily participated in this study was classified as an older adult, which might lead to difficulties in filling up the questionnaire. Whether related to the interpretation of questions or how to fill it up. A former study stated that adults may perceive data-gathering procedures differently, resulting in variation rates of involvement and response (Quinn, 2010). Apart from this, they tend to see first whether the process is difficult or takes longer.

In the area of statistics, Kaiser introduced the Measure of Sampling Adequacy (MSA), which was later modified by Kaiser and Rice (Kaiser, 1970; Kaiser and Rice, 1974). The Kaiser-Meyer-Olkin (KMO) statistic, which ranges from 0 to 1, indicates how accurately other variables predict each variable in a set. KMO determines the relevance of the data used in the Factor Analysis. This test determines the sufficiency of the sample for each indicator of the variable. In this test, the minimum KMO value was 0.5.

The MSA test is used to measure the homogeneity between indicators in one factor and select indicators so that only qualified indicators can be processed further (Cerny and Kaiser, 1977). Where the MSA value is 0.5 – 1.0. This test can be seen in the Anti-Image Matrices table in the Anti-Image Correlation section.

The extraction process determines the contribution of obtaining how much an indicator to a factor. Principal component analysis (PCA) was used to obtain the extraction value of each indicator. The number of indicators to be extracted is shown in the component matrix table. The component matrix helps interpret the factors produced by factor analysis. By examining the correlation coefficient between the input variable and the factors, we can identify the variable that has the strongest correlation with each factor. A variable with a high correlation coefficient for a particular factor can be considered to have a greater contribution to that factor. By examining the component matrix, researchers can understand how input variables relate to the factors produced, which can help in understanding factor construction or decision making in factor analysis.

The Total Variance Explained is useful for understanding how much variation in data can be explained by factors resulting from the factor analysis. For example, if we have a 30% variance, that factor explains 30% of the variance in our data. In the CFA, only one factor is used, so the resulting variance value must be at least 50%.

The component matrix shows the correlation coefficient between each input variable and the identified factors. In the component matrix, each cell represents the correlation coefficient between a particular input variable and the resulting factor. This coefficient is closer to 1, the better with the minimum limit value used to indicate that the indicator is valid at 0.5. This component matrix helps interpret the factors produced by factor analysis. By examining the correlation between the input variables and factors, we can identify which variable has the strongest correlation with each factor. Variables with a high correlation coefficient with other factors can be considered to have a greater contribution to this factor (Mukaka, 2012).

The KMO and Bartlett's test table show two tests that demonstrate the suitability of the data used for structure detection. The KMO value in the table is 0.678, which means that the indicators used are suitable for continued factor analysis. Bartlett's Test of Sphericity tests the correlation matrix hypothesis that the indicators used are unrelated, and therefore unsuitable for structure detection. If the significance value is less than 0.05 (hypothesis rejected) which means then factor analysis is quite feasible with the data used. The KMO and Bartlett's test table shows a sig value, which means that the data are feasible enough to continue in the factor analysis.

Reliability was measured based on consistency. The internal consistency reliability coefficient of the Indonesian version of the DOQ was high for each scale, indicating high reliability. However, a previous study elaborated that although the coefficient alpha may be a good estimator of reliability under certain circumstances, it has limitations. Coefficient alpha is related to reliability and not validity. A former study stated that coefficient alpha is useful for predicting reliability in a particular case in which item-specific variance in a unidimensional test is of interest (Cortina, 1993). A high coefficient alpha does not prove that researchers measure what they intend to do; rather,

they measure the same thing consistently. Reliability and validity complement each other for a valid instrument, and the reliability of the instrument must be high. However, if the test is invalid, reliability does not matter. Additionally, the alpha coefficient did not provide evidence of the dimensionality of the scale. A scale can be unidimensional and have a low or high coefficient alpha; however, a scale can be multidimensional and has a low or a high coefficient alpha.

The DOQ is a valid and reliable instrument to inform patients of the kind of obstacles they face in their daily lives regarding self-management of diabetes. However, some adjustments must be made in the context of Indonesia. The cultural context, how it is delivered, and terms used need to be checked to obtain valid information from patients. Diabetes was perceived as a visible and scary disease. The patients seemed to have unrealistic optimism and believed that it would not affect them because no family member had previously been affected (Pujilestari *et al.*, 2014). Another study found that people with diabetes often construct illness notions into their narratives based on their experiences, and the usage of local words may lead to misconceptions about the disease and its symptoms (Widayanti *et al.*, 2020). In addition, an ethnographic exploration of the cultural beliefs and practices of persons with diabetes showed that some misconceptions concerning diabetes and its care are often experienced among Japanese patients (Sari *et al.*, 2022). However, some studies have reported promising results for diabetes (Arifin, Probandari, *et al.*, 2019; Ligita *et al.*, 2019).

The questionnaire included a diverse range of statements, including both positive and negative questions. These statements were designed to confirm the situation rather than to question it. When a statement is presented negatively, listeners must be able to adapt to the presented conditions. Negative statements serve to express opposing ideas, but they simply indicate what is not factual. To respond to these statements correctly, it is necessary to convert affirmative statements to negative ones. A study reported that it is more difficult for the brain to process, as it works in opposition to affirmation (Spychalska, Kontinen and Werning, 2016). Problems may arise in response to negative statements, as this is the reverse of the real situation. Additionally, it is confusing for the majority of people because the brain will only focus on the first stimulus we are thinking about. The size of attentional focus can be adjusted in response to pre-cues, although increasing the attentional focus area reduces processing efficiency (Castiello and Umilta, 1990). This proves that the human brain can concentrate on only one thing at a time.

After evaluating the process used in this pilot study, several limitations were identified. These shortcomings are a cause for concern and must be addressed to ensure effective implementation in future studies. First, the sample of patients may not be completely representative of the Indonesian population. Even though there is no agreement in the worldwide literature on how large a sample size should be to verify a questionnaire, a rule of thumb of 100–300 is frequently proposed. Therefore, the number of 54 participants is probably insufficient. Second, the recruitment of people living with diabetes might have been biased, as they were not categorized as having type 1 diabetes or T2DM. Third, the measurement of HbA1c and C-peptide levels and diabetes confirmatory diagnostic tests were not conducted because of presumed urgency and limited financial resources. These diagnostic tests, which were examined less frequently, were not administered. Implementing diabetes management programs may improve access to services by eliminating direct medical costs, but significant socioeconomic and geographical disparities persist among National Health Insurance users (Mulyanto *et al.*, 2023).

Despite its shortcomings, the DOQ enables a more explanatory and comprehensive approach to adherence, which is crucial for listening comprehension, concordance, and personalized care. The use of this questionnaire to assess people with diabetes barriers to diabetes self-management helps healthcare providers recognize what individuals face, so that they can design appropriate tailored interventions to solve their problems.

Conclusion

This study concluded that the Indonesian version of the 57-item DOQ is a valid tool for identifying the challenges faced by individuals with diabetes in Indonesia. This can aid researchers in exploring the difficulties faced by these individuals in managing their condition. Future research should include a larger participant group and consider the specific types of diabetes diagnosed in individuals.

Acknowledgments

We thank the nurses and linguistic professionals who reviewed the questionnaires and the respondents who participated in this study.

Funding Source

The authors would like to thank Universitas Diponegoro for the grant for this research with contract number 569-48/UN7.D2/PP/VII/2022.

Data Availability

The data that support the findings of this study are not openly available owing to reasons of sensitivity and are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that there is no competing interest.

References

Alkaff, F. F. et al. (2021) 'The Impact of the Indonesian Chronic Disease Management Program (PROLANIS) on Metabolic Control and Renal Function of Type 2 Diabetes Mellitus Patients in Primary Care Setting', Journal of Primary Care and Community Health, 12. doi: 10.1177/2150132720984409.

Arifin, B., van Asselt, A. D. I., et al. (2019) 'Diabetes distress in Indonesian patients with type 2 diabetes: a comparison between primary and tertiary care', BMC health services research, 19(1), p. 773. doi: 10.1186/s12913-019-4515-1.

Arifin, B., Probandari, A., et al. (2019) '"Diabetes is a gift from god" a qualitative study coping with diabetes distress by Indonesian outpatients', Quality of Life Research, (0123456789). doi: 10.1007/s11136-019-02299-2.

Bagby, R. M., Goldbloom, D. S. and Schulte, F. S. M. (2006) 'The Use of Standardized Rating Scales in Clinical Practice', in Goldbloom, D. S. (ed.) Psychiatric Clinical Skills. Toronto: Mosby Elsevier, pp. 11–17. doi: https://doi.org/10.1016/B978-0-323-03123-3.X5001-7.

Beaton, D. E. et al. (2000) 'Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures', SPINE, 25(24), pp. 3186–3191.

Bhagavathula, A. S. et al. (2018) 'Perceived Obstacles Faced by Diabetes Patients Attending University of Gondar Hospital , Northwest Ethiopia', Frontiers in Public Health, 6(March), pp. 1–7. doi: 10.3389/fpubh.2018.00081.

Castiello, U. and Umilta, C. (1990) 'Size of the attentional focus and efficiency of processing', Acta Psychologica, 73(3), pp. 195–209. doi: https://doi.org/10.1016/0001-6918(90)90022-8.

Cerny, B. A. and Kaiser, H. F. (1977) 'A study of a measure of sampling adequacy for factor-analytic correlation matrices', Multivariate Behavioral Research, 12(1), pp. 43–47. doi: 10.1207/s15327906mbr1201_3.

Chatterjee, S., Khunti, K. and Davies, M. J. (2017) 'Type 2 diabetes', The Lancet, 389(10085), pp. 2239–2251. doi: 10.1016/S0140-6736(17)30058-2.

Cortina, J. M. (1993) 'What is coefficient alpha? An examination of theory and applications', Journal of Applied Psychology, 78(1), pp. 98–104.

Dewi, A. (2011) 'English(es) for Indonesians: A Review on Literatures', Journal of English Language and Culture, 1(2), pp. 143–155.

Egan, A. M. and Dinneen, S. F. (2019) 'What is diabetes?', Medicine (United Kingdom), 47(1), pp. 1–4. doi: 10.1016/j.mpmed.2018.10.002.

Hearnshaw, H. et al. (2007) 'Development and validation of the Diabetes Obstacles Questionnaire (DOQ) to assess obstacles in living with Type 2 diabetes', Diabetic Medicine, 24(8), pp. 878–882. doi: 10.1111/j.1464-5491.2007.02137.x.

Inga-Britt, L. and Kerstin, B. (2018) 'Challenges faced in daily life by persons with type 2 diabetes: A meta-synthesis', Chronic Illness, 15(3), pp. 167–186. doi: 10.1177/1742395318757852.

International Diabetes Federation (2021) IDF Diabetes Atlas. 10th Editi. doi: 10.1016/j.diabres.2013.10.013.

Kaiser, H. (1970) 'A second generation little jiffy', Psychometrika, 35(4), pp. 401–415.

Kaiser, H. and Rice, J. (1974) 'Little jiffy, mark IV', Educational and psychological mesurement, 34(1), pp. 111–117.

Kalra, S., Jena, B. N. and Yeravdekar, R. (2018) 'Emotional and psychological needs of people with diabetes', Indian Journal of Endocrinology and Metabolism, 22(5), pp. 696–704. doi: 10.4103/ijem.IJEM_579_17.

Krishna, P. (2018) 'Depression, anxiety, and stress levels in patients with type 2 diabetes mellitus', National Journal of Physiology, Pharmacy and Pharmacology, 8(9), p. 1570. doi: 10.5455/njppp.2018.8.0929117092018.

Ligita, T. et al. (2019) 'How people living with diabetes in Indonesia learn about their disease: A grounded theory study', PLoS ONE, 14(2), pp. 1–19. doi: 10.1371/journal.pone.0212019.

Mukaka, M. M. (2012) 'Statistics corner: A guide to appropriate use of correlation coefficient in medical research', Malawi Medical Journal, 24(3), pp. 69–71.

Mulyanto, J. et al. (2023) 'Exploring Inequalities in the Use, Quality, and Outcome of the Diabetes Management Program of Indonesian National Health Insurance', Health Equity, 7(1), pp. 644–652. doi: 10.1089/heq.2023.0025.

Mwila, K. F., Bwembya, P. A. and Jacobs, C. (2019) 'Experiences and challenges of adults living with type 2 diabetes mellitus presenting at the University Teaching Hospital in Lusaka , Zambia', BMJ Open Diabetes Research and Care, 7(e000497), pp. 1–6. doi: 10.1136/bmjdrc-2017-000497.

Patty, Y. F. P. P., Mufarrihah and Nita, Y. (2021) 'Cost of illness of diabetes mellitus in Indonesia: A systematic review', Journal of Basic and Clinical Physiology and Pharmacology, 32(4), pp. 285–295. doi: 10.1515/jbcpp-2020-0502.

Pilv, L. et al. (2016) 'Development and validation of the short version of the diabetes obstacles questionnaire (DOQ-30) in six European countries', European Journal of General Practice, 22(1), pp. 16–22. doi: 10.3109/13814788.2015.1093619.

Pujilestari, C. U. et al. (2014) 'It is not possible for me to have diabetes - Community Perceptions on Diabetes and Its Risk Factors in Rural Purworejo District, Central Java, Indonesia', Global Journal of Health Science, 6(5), pp. 204–218. doi: 10.5539/gjhs.v6n5p204.

Punthakee, Z., Goldenberg, R. and Katz, P. (2018) 'Definition, classification and diagnosis of diabetes, prediabetes and metabolic syndrome', Canadian Journal of Diabetes, 42, pp. S10–S15. doi: 10.1016/j.jcjd.2017.10.003.

Putri, L. P., Mawarni, D. and Trisnantoro, L. (2020) 'Challenges of Shifting Diabetes Mellitus Care From Secondary- to Primary-Level Care in Urban and Rural Districts: A Qualitative Inquiry Among

Health Providers', Journal of Primary Care and Community Health, 11. doi: 10.1177/2150132720924214.

Quinn, K. (2010) 'Methodological considerations in surveys of older adults : technology matters Methodological Considerations in Surveys of Older Adults : Technology Matters', International Journal of Emerging Technologies and Society, 8(2), pp. 114–133. doi: 10.13140/2.1.3897.9209.

Rariden, C. (2019) 'Diabetes Distress: Assessment and Management of the Emotional Aspect of Diabetes Mellitus', The Journal for Nurse Practitioners, 15(9), pp. 653–656. doi: 10.1016/J.NURPRA.2019.06.020.

Revicki, D. (2014) 'Internal Consistency Reliability', in Michalos, A. C. (ed.) Encyclopedia of Quality of Life and Well-Being Research. Dordrecht: Springer Netherlands, pp. 3305–3306. doi: 10.1007/978-94-007-0753-5_1494.

Sari, Y. et al. (2022) 'The cultural beliefs and practices of diabetes self-management in Javanese diabetic patients: An ethnographic study', Heliyon, 8(2), p. e08873. doi: 10.1016/j.heliyon.2022.e08873.

Soewondo, P., Ferrario, A. and Tahapary, D. L. (2013) 'Challenges in diabetes management in Indonesia: A literature review', Globalization and Health, 9(1), pp. 1–17. doi: 10.1186/1744-8603-9-63.

Spychalska, M., Kontinen, J. and Werning, M. (2016) 'Investigating scalar implicatures in a truth-value judgement task: evidence from event-related brain potentials', Language, Cognition and Neuroscience, 31(6817–840).

Suastika, K. et al. (2022) 'Expert Opinion on Diabetes Management Challenges and Role of Basal Insulin/GLP-1 RA Fixed-Ratio Combination in People with Type 2 Diabetes from Indonesia', Diabetes, Metabolic Syndrome and Obesity, 15(September 2022), pp. 2977–2990. doi: 10.2147/DMSO.S367153.

Tanoey, J. and Becher, H. (2021) 'Diabetes prevalence and risk factors of early-onset adult diabetes: results from the Indonesian family life survey', Global Health Action, 14(1). doi: 10.1080/16549716.2021.2001144.

Trauth, J. et al. (2000) 'Public attitudes regarding willingness to participate in medical research studies', J Health Soc Policy, 12(2), pp. 23–43. doi: 10.1300/J045v12n02_02.

Wahidin, M. et al. (2024) 'Projection of diabetes morbidity and mortality till 2045 in Indonesia based on risk factors and NCD prevention and control programs', Scientific Reports, 14(1), pp. 1–17. doi: 10.1038/s41598-024-54563-2.

Widayanti, A. W. et al. (2020) 'Lay perceptions and illness experiences of people with type 2 diabetes in Indonesia: a qualitative study', Health Psychology and Behavioral Medicine, 8(1), pp. 1–15. doi: 10.1080/21642850.2019.1699101.

World Health Organization (WHO) (2023) Diabetes, 5 April 2023.

How to cite this article: Kusumaningrum, N. S. D., and Handayani, F. (2024) 'A Pilot Translation And Adaptation Of The Diabetes Obstacle Questionnaire (DOQ) To Measure Obstacles And Challenges In Diabetes Management For People With Diabetes In Indonesia', Jurnal Ners, 19(4), pp. 459-468. doi: http://dx.doi.org/10.20473/jn.v19i4.57107