DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE ON KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING THE USE OF NATURAL MEDICINE IN DIABETES MELLITUS

Santi Setiani [1]*, Maria Caecilia NSH[1]., Yosef Wijoyo[2]
[1] Magister Farmasi STIFAR Yayasan Pharmasi Semarang, Semarang, Indonesia
[2] The Faculty of Pharmacy, Sanata Dharma University, Yogyakarta, Indonesia

email: santisasongko08@gmail.com

Abstract

The use of natural antidiabetic drugs is increasing, thus requiring an accurate and reliable instrument to assess the level of knowledge, attitudes, and practices of diabetes mellitus (DM) patients in their use. This study aims to develop and validate a comprehensive instrument to measure these aspects. The research method used includes research and development with quantitative and qualitative approaches. Content validation was conducted by 2 experts, namely an academician and a practitioner, while the language comprehension test involved 5 respondents, and the validity and reliability tests were conducted on 30 respondents. The research test results show that content validation is deemed valid by expert validators, the language comprehension test results meet the same criteria as the research target, and the validity and reliability tests are declared valid and reliable with a Crobach Alpha value >0.60 for each measured aspect, namely knowledge 0.753 (10 items), attitude 0.719 (12 items), and practice 0.742 (7 items). Thus, it can be concluded that the developed questionnaire can be used as an effective evaluation tool in assessing patients' understanding of the use of natural substance drugs in the treatment of diabetes mellitus.

Keywords: instrument validation, natural medicine, diabetes mellitus.

1. INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease that requires long-term management, including the use of medications. One of the alternatives widely used by the community is herbal medicine. However, the success of the therapy highly depends on the knowledge, attitudes, and actions of the patients in its use. Therefore, a valid and reliable instrument is needed to measure the aspects of knowledge, attitude, and practices of diabetes mellitus patients (Nopita & Wijoyo, 2022).

The increase in the prevalence of diabetes in Indonesia poses a significant challenge to the healthcare system. Many patients adopt alternative medicine without understanding the side effects and interactions with conventional drugs (Ayuningtyas et al., 2023). Therefore, the development of a measurement tool that can assess the extent of patients' understanding and

attitudes towards this therapy becomes important to support more effective interventions (Nopita & Wijoyo, 2022).

According to Arikunto (2010) in Yusup (2018), the accuracy of data depends on the quality of the instrument used in the research data collection. A person's knowledge plays an important role in the management of diabetes mellitus, and having good knowledge about the management of diabetes mellitus is expected to help diabetes mellitus patients better control their disease. Knowledge greatly influences a person's attitudes and practice (Hutahaean & Anggraini, 2021).

Attitude is the result of a general evaluation made by humans about themselves or others in response to a stimulus, leading to feelings accompanied by actions (Rustanti & Kusuma, 2014). An open attitude towards the use of natural ingredient antidiabetic drugs by respondents will also lead to open practices in the use of natural ingredient antidiabetic drugs by respondents. Practices is the ability of humans to apply what they know to the stimuli they receive. Action refers to behavior that is expressed in the form of deeds. Actions are the tangible forms of knowledge and attitudes that have been possessed (Sari et al., 2022).

This research aims to develop and validate a questionnaire that can measure patients' knowledge, attitudes, and practices related to the use of natural medicine for diabetes mellitus. This article will explain the steps in developing a research questionnaire, which is very necessary to obtain a research instrument on the knowledge, attitudes, and practices of diabetes mellitus patients towards the use of natural medicine that is suitable for use.

2. METHOD

The development of the questionnaire was carried out through several stages: (1) the statement material was created based on previous literature, the statements consist of positive (favorable) and negative (unfavorable) statements Zaidi et al., (2022), Kasole et al.,(2019), Ayuningtyas et al., (2023), Nauviyah, (2018), (2) the preparation of knowledge questionnaire items is measured using the Gutman scale with definitive answers for each statement, namely true and false. The attitude and action questionnaire was measured using a Likert scale, with the response options for the attitude questionnaire being strongly agree, agree, neutral, disagree, and strongly disagree. The answers to the practices statements are always, often, sometimes, rarely, never. (3) Content validation by two experts (expert judgement) is calculated using the Gregory formula, (4) Language comprehension test by 5 DM patients, and (5) Validity and reliability test on 30 DM patients.

The scoring process for drawing conclusions about knowledge, attitudes, and practices can be calculated by comparing the maximum score using the formula:

$$\text{Skor} = \frac{\text{The score achieved context}}{\text{Maximum score}} \text{ x } 100\%$$

According to Karuniawati et al., (2021) the score calculation results can be categorized into:

a. good or high with a score >70%

b. sufficient or moderate with a score of 50% - 70%

c. poor or low with a score of <50%

3. DATA ANALYSIS

Content validity test of the questionnaire

The content validity test of the questionnaire in this study used 2 (two) expert validators who are competent in their fields, namely an academician from Gadjah Mada University and a community pharmacist practitioner. The content validity test of the questionnaire with 2 (two) validators can be analyzed for the content validity coefficient using the Gregory equation to determine whether the items in the questionnaire are valid or not valid (Salsabila et al., 2023).

The values, suggestions, and inputs on the items in the questionnaire from the validators are then used to calculate the content validity coefficient of the questionnaire using the Gregory equation and are revised by the researcher according to the suggestions provided by the validators. The researcher then submits the calculation results and the revised questionnaire content back to the validators for approval. The Gregory matrix table can be seen in Table 1 as follows:

Table 1. Matrix Table Gregory

Matrix 2x2		**Validator (1)**	
		Less Relevant Score 1-2	**Very Relevant Score 3-4**
Validator (2)	Less Relevant Score 1-2	A	B
	Very Relevant Score 3-4	C	D

The explanation in the matrix tabulation is:

a. A is the number of items with a less relevant assessment with a score of 1-2 by both validators.

b. B is the number of items with a less relevant rating of 1-2 by the validator (2).

c. C is the number of items with a less relevant rating of 1-2 by the validator (1).

d. D is the number of items with a very relevant rating of 3-4 by both validators.

Gregory's formula for determining the content validity coefficient of a questionnaire is:

$$\text{Content validity coefficient} = \frac{D}{A + B + C + D}$$

The value of the content validity coefficient of the questionnaire calculated using the Gregory formula can be interpreted into five (5) categories of instrument content validity. The content validity coefficient of Gregory's equation is presented in Table 2 as follows:

Table 2. Gregory's Equation Content Validity Coefficient

Coefficient Value	Validity
0,8 – 1	Very High Validity
0,6 – 0,79	High Validity
0,40 – 0,59	Moderate Validity
0,20 – 0,39	Low Validity
0,00 – 0,19	Very Low Validity

Language comprehension test questionnaire

The language comprehension test of the questionnaire is conducted after the research questionnaire has been content-validated and deemed valid. The language comprehension test of the questionnaire in the quantitative research was administered to 5 (five) patient respondents who met the same criteria as the research subjects (Nopita & Wijoyo, 2022).

The results of the language comprehension test in the form of suggestions and feedback from patient respondents are used as a reference for researchers to modify phrases or statements in the questionnaire so that they are easily understood by respondents. The language comprehension test of the questionnaire is considered valid if the respondents as validators can understand the choice of words or sentences used in the questionnaire, which means that the statements in the knowledge, attitude, and practice questionnaire represent the intended meaning in the research. The final result of the language comprehension test included several statement items that were adjusted by the researcher by modifying the statement sentences according to the suggestions and input from the respondents.

Validity and reliability test of the questionnaire

The validity test of the questionnaire items was trialed on 30 patient respondents who met the same inclusion criteria as the research subjects. The validity test is conducted to determine whether the items on the questionnaire to be used in the study are appropriate or not

(Amalia et al., 2022). The R table value with 30 respondent data at a significance level of 0.05 is 0.3061.

The validity test of the items (questions) on the questionnaire was analyzed using SPSS version 23 statistical software. The validity test results were obtained from the comparison between the calculated r-value and the table r-value. An item is said to be valid if it correlates significantly with the total score, indicated by the value of r-count > r-table (Sutriyawan et al., 2023).

The reliability test of the questionnaire using the Cronbach's alpha coefficient test which was tested on 30 respondents. The questionnaire is declared reliable if the Cornbach alpha value ≥ 0.6 and the questionnaire is declared unreliable if the Cornbach alpha < 0.6 (Sutriyawan et al., 2023).

4. RESULTS AND DISCUSSION

Content validity test of the questionnaire

The content validity test of the questionnaire by 2 (two) expert judgments needs to be conducted to assess the feasibility of instrument development. The validators in the content validity test of the questionnaire provided suggestions and input on the items in the questionnaire, and the researcher has revised the content of the questionnaire according to the suggestions given by the validators.

The content validity test of the questionnaire using 2 (two) validators can determine the content validity coefficient by calculating the scores given by the validators using the Gregory formula to determine whether the items in the questionnaire are valid or not valid. The assessment of the correlation of statements in the questionnaire with 2 (two) validators can be determined using the Gregory index in a 2x2 matrix table, with a score of 3-4 for statements that are very relevant and a score of 1-2 for statements that are less relevant (Salsabila et al., 2023).

The results of the content validity test of the questionnaire on the variables of knowledge, attitude, and practice using the Gregory method show that the questionnaire is valid and suitable for use in the research. The results of the calculation of the knowledge, attitude, and practices questionnaires using the Gregory formula are presented in tables 3, 4, and 5 as follows.

Table 3. Content validity coefficient of the knowledge questionnaire

Matrix knowledge		Validator (1)	
		Less Relevant Score 1-2	Very Relevant Score 3-4
Validator (2)	Less Relevant Score 1-2	0	4
	Very Relevant Score 3-4	0	13

Knowledge content validity coefficient

$$= \frac{D}{A+B+C+D} = \frac{13}{0+4+0+13} = \frac{13}{17} = 0{,}764 \text{ (0,6-0,79 high validity)}$$

Table 4. Content validity coefficient of the attitude questionnaire

Matrix Attitude		Validator (1)	
		Less Relevant Score 1-2	Very Relevant Score 3-4
Validator (2)	Less Relevant Score 1-2	0	0
	Very Relevant Score 3-4	0	14

Attitude content validity coefficient

$$= \frac{D}{A+B+C+D} = \frac{14}{0+0+0+14} = \frac{14}{14} = 1 \text{ (0,8-1 very high validity)}$$

Table 5. Content validity coefficient of the practices questionnaire

Matrix practices		Validator (1)	
		Less Relevant Score 1-2	Very Relevant Score 3-4
Validator (2)	Less Relevant Score 1-2	0	0
	Very Relevant Score 3-4	0	11

Practice content validity coefficient

$$= \frac{D}{A+B+C+D} = \frac{11}{0+0+0+11} = \frac{11}{11} = 1 \text{ (0,8-1 very high validity)}$$

Language comprehension test questionnaire

The results of the language comprehension test in the form of suggestions and feedback from patient respondents are used as a reference for researchers to modify phrases or statements in the questionnaire so that they are easily understood by respondents. The language comprehension test of the questionnaire is considered valid if the respondents as validators can understand the choice of words or sentences used in the questionnaire, which means that the statements in the knowledge, attitude, and practice questionnaire represent the intended meaning in the research. The final results of the language comprehension test included several statement items that were adjusted by the researcher by modifying the statements according to the suggestions and input from the respondents. The results of the language comprehension test are presented in Table 6 as follows.

Table 6. Results of the language comprehension test

Variabel	statement		Validator 5 responden				
	F	UF	1	2	3	4	5
Knowledge	9 Q	8 Q	U	U	U	U	U
Attitude	9 Q	5 Q	U	U	U	U	U
Practices	7 Q	4 Q	U	U	U	U	U

Explanation: F = favorable; UF = unfavorable; U = understood; Q = questions

Validity and reliability test of the questionnaire

The validity test of the questionnaire items was trialed on 30 patient respondents who met the same inclusion criteria as the research subjects. The item validity test (question items) on the questionnaire was analyzed using SPSS version 23 statistical software. The R table value with 30 respondent data at a significance level of 0.05 is 0.3061. The validity test of the questionnaire items on knowledge, attitudes, and practices is declared valid if the r-count value > 0.3061. The research results show that there are valid and invalid items in the questionnaire. The researcher then proceeded to remove the invalid items. The items that are declared valid can then undergo a reliability test. The results of the validity test for the knowledge questionnaire show that there are 10 valid items, the attitude questionnaire has 12 valid items, and the practice questionnaire has 7 valid items.

The researchers then conducted a reliability test of the knowledge, attitude, and practice questionnaire using the Cronbach's alpha coefficient test. The calculation result of the Cornbach alpha for the knowledge variable is (0.753). Attitude (0.719), and practice (0.742), the reliability

test of each variable obtained a Cronbach's alpha value of more than 0.60, so it can be concluded that the variables of knowledge, attitude, and practice of the patients are declared reliable, represented by the items of each variable.

The validity and reliability tests of the questionnaire conducted by the researcher show that the items in the knowledge, attitude, and practice questionnaire meet the criteria for being valid and reliable. The knowledge, attitude, and practice questionnaire developed by the researcher is stated to be usable as a quantitative research tool. The results of the development of the knowledge, attitude, and practice questionnaire can be seen in tables 7, 8, and 9.

Table 7. Knowledge questionnaire

Number	Statement
1	Natural antidiabetic drugs are safe when used in conjunction with antidiabetic medications prescribed by a doctor.
2	Natural ingredient antidiabetic drugs can be consumed not according to the usage instructions on the packaging label.
3	Natural medicine may contain chemical drugs.
4	Antidiabetic drugs made from natural ingredients are easily available at pharmacies.
5	Information about natural medicine products for diabetes treatment from electronic media with unclear dosage instructions can be trusted.
6	Natural antidiabetic medications are not meant to be used continuously for long periods.
7	If the use of natural ingredient antidiabetic drugs does not show any health improvement, there is no need to consult a pharmacist.
8	The use of natural substance drugs for diabetes treatment does not require supervision from a pharmacist.
9	Natural antidiabetic medications can be taken together with prescription antidiabetic medications without any time gap.
10	Antidiabetic drugs from natural ingredients do not have side effects.

Table 8. Attitude questionnaire

Number	Statement
1	I take herbal medicine for diabetes treatment according to the usage instructions on the packaging label.
2	Natural antidiabetic drugs are not effective for treating diabetes compared to prescription antidiabetic medications.
3	I use natural herbal medicine as a complementary treatment for diabetes.
4	I am concerned about the side effects of long-term use of natural substance drugs for diabetes treatment.
5	I believe that the combination of prescription antidiabetic medication with natural antidiabetic remedies for diabetes treatment is the best choice.
6	I take herbal antidiabetic medicine because my blood sugar levels remain high even after using the antidiabetic medicine prescribed by the doctor.
7	Although I experienced side effects from the natural diabetes medication, I will continue to use it as long as the side effects are not harmful.
8	Natural antidiabetic medications are not safe to consume compared to prescription antidiabetic medications for diabetes treatment.
9	I use natural remedies for diabetes treatment because they align with my culture and traditions.
10	I believe that natural remedies for diabetes treatment are cheaper than prescription antidiabetic medications.
11	The benefits of natural remedy drugs for diabetes treatment are exaggerated.
12	My blood sugar levels will not remain stable (controlled) if I use herbal medicine for diabetes treatment.

Table 9. Practices questionnaire

Number	Statement
1	I use natural ingredient antidiabetic medicine to manage the diabetes I suffer from.
2	I read the label and product information before using the natural diabetes medication.
3	I reported the side effects of the natural ingredient antidiabetic medication I experienced to the pharmacist.
4	I combined the use of natural ingredient antidiabetic drugs with doctor-prescribed antidiabetic drugs without consulting first.
5	I discussed the use of natural ingredient antidiabetic drugs with the pharmacist.
6	I am looking for information about herbal medicine for diabetes treatment from a pharmacist.
7	I follow a healthy diet and exercise in addition to using natural herbal antidiabetic medication.

5. CONCLUSION

The questionnaire developed in this study has proven to be valid and reliable in measuring patients' knowledge, attitudes, and practices regarding the use of natural substance drugs in diabetes mellitus. With the existence of this questionnaire, healthcare professionals can identify aspects that need to be improved in educational interventions for DM patients. In addition, the results of this study can serve as a basis for policies to improve pharmaceutical services, especially in the safer and more controlled use of natural ingredient medications.

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