Reliability and Validity of the Filipino-translated Diabetes Self-management Questionnaire and its Correlation with HbA1c

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Abstract

Background. Diabetes self-management is a fundamental aspect of diabetes care and has a significant impact on diabetes-related mortality and morbidity. Assessment of self-care management is thus essential for clinicians and educators seeking better outcomes. However, there are no Filipino-validated tools to objectively measure this.

Methodology. A cross-sectional analytic study was done among adult Type 2 diabetic mellitus (T2DM) patients at the Ilocos Training and Regional Medical Center (ITRMC) Department of Internal Medicine outpatient clinic and three private diabetes clinics to determine the reliability and validity of the Filipino-translated Diabetes Self-Management Questionnaire (DSMQ) and its association with glycemic control as measured using glycosylated hemoglobin (HbA1c) values and categorized into good ($\leq$ 7%), moderate (7-8.9%) and poor ($\geq$ 9%) control. The English version of the DSMQ was translated to Filipino using forward-backward translation. The pre-tested Filipino translated questionnaire was then distributed to the participants and the responses were analyzed using Cronbach's alpha, Pearson's coefficient, and one–way analyses of variance.

Results. There were a total of 78 respondents. The test-retest reliability showed a statistically significant correlation ($p < 0.05$). All the items showed a high difficulty index. Known group validity was computed based on categorized HbA1c values. DSMQ sum scores and subscales showed no significant differences among the three categories of glycemic control.

Conclusion. The Filipino-translated DSMQ is a reliable tool for measuring the self-care of Filipinos with type 2 diabetes mellitus. Future research using it with a larger sample size and analysis for other factors affecting diabetes control may be better able to demonstrate its association with glycemic control.

Keywords. diabetes care, psychometric instrument, self-care behavior, self-management

Introduction

The prevalence of Type 2 diabetes mellitus (T2DM) worldwide saw a nearly four-fold increase from 108 million in 1980 to 422 million in 2014, with future estimates predicting a progressive increase in prevalence. In 2019, T2DM was touted to be the direct cause of 1.5 million deaths, and 48% of all T2DM deaths were noted to occur among patients less than 70 years of age.[1] It is one of the four priority noncommunicable diseases (NCDs) targeted for action by world leaders, as it is predicted to become the seventh leading cause of death globally by 2030.[2]

In the Philippines, the national prevalence of diabetes is 7.1%.[3] T2DM is seen to develop at a younger age, usually a decade earlier than Caucasians. As T2DM starts early in life, this brings with it an associated increase in morbidity and mortality and an increase in the lifetime risk of cardiovascular disease.

Since T2DM is a chronic illness, there are continued needs and demands that need to be addressed. T2DM-associated complications, fortunately, do not appear until the second decade of chronic hyperglycemia, which thus can be prevented and delayed with early detection, aggressive glycemic control, and efforts to minimize the risks of complications.[4] Despite continuous advancements in T2DM treatment, overall glycemic control in the Philippines remain low, with only about 15% of patients achieving target HbA1c in the DiabCare 2008 study.[5] Hence the need to address other aspects in T2DM care, which include patient self-management.

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Self-care in T2DM is defined as an evolutionary process of the development of knowledge or awareness by learning to survive with the complex nature of T2DM in a social context. Seven essential self-care behaviors in people with T2DM predict good outcomes. These are healthy eating, being physically active, monitoring of blood sugar, compliance with medications, good problem-solving skills, healthy coping skills, and risk-reduction behaviors. Self-report could help physicians and educators to individualize therapy in diabetic patients. It is the most cost-effective and practical approach to self-care assessment and is currently of great interest to researchers.[6]

The American Diabetes Association guidelines for the Standards of Medical Care in Diabetes have long espoused diabetes self-management education and support (DSMES) as an integral part of overall T2DM management. DSME is the ongoing process of facilitating the knowledge, skill, and ability necessary for T2DM self-care. The key goals are "to support informed decision-making, self-care behavior, problem-solving, and active collaboration with the health care team to improve clinical outcomes, health status, and well-being cost-effectively".[7]

A prospective, education-intervention trial on the effectiveness of a community-based diabetes self-management education (DSME) program conducted in the Philippines showed lower mean HbA1c levels after three and six months of DSME. It also promoted foot examination as a diabetes self-care practice.[8]

Several tools are available for assessing self-care among diabetic patients. The Summary of Diabetes Self-Care Activities Measure (SDSCA) which was developed in 1993 and revised in 2003 is the most commonly used research tool to assess self-management today. It covers five essential management domains – general diet, specific diet, exercise, blood glucose testing, and foot care. However, it was shown to have a low association with glycemic control.[9,10.] The Diabetes Self-Management Questionnaire (DSMQ) is another tool - a questionnaire that consists of 16 items covering five different aspects of T2DM management, which includes dietary control, medication adherence, blood glucose monitoring, physical activity, and contact with health care professionals.[9] This questionnaire was found to have a better association with glycemic control than the SDSCA scale.[11] This questionnaire provides an option for the respondent to tick the "not required box" for items to self-monitoring of blood glucose (items 1,6 and 10) and T2DM medication intake (items 4 and 12).

The clinician must assess the degree of their patient's diabetes self-management and detect patient-specific potential areas for improvement. A standardized psychometric assessment tool that provides reliable and valid assessments of the essential domains of diabetes self-management will be important.[9] However, some contents of existing questionnaires may not be culturally valid and patients whose primary language is Filipino, may have difficulty comprehending an English-language questionnaire. Hence, we undertook the Filipino translation and validation of the DSMQ tool. This was preferred over the SDSCA due to evidence of its better association with glycemic control.

Objectives.   General Objective.   To determine the reliability and validity of a Filipino-translated Diabetes Self-Management Questionnaire (DSMQ) in measuring diabetes self-care activities of adult T2DM patients.

Specific Objectives.

1. To determine the reliability of a Filipino-translated Diabetes Self-Management Questionnaire
2. To assess the validity of a Filipino-translated Diabetes Self-Management Questionnaire with glycemic control using HbA1c

Methodology

Inclusion and Exclusion Criteria. This is a cross-sectional analytic study that was conducted among adult T2DM patients coming from a tertiary government hospital and three private clinics in San Fernando City, La Union. Patients eligible for participation in the study were recruited from the waiting areas of their respective clinics.

Patients who were less than 18 years old, had Type 1 DM, had newly diagnosed T2DM (less than 6 months from initial diagnosis), poor Filipino language skills, no available HbA1c value within the past 6 months before study inclusion, and did not provide informed consent were excluded.

Instrument Translation and Administration. The English version of the DSMQ (*see Appendix 1*) was translated to Filipino (*see Appendix 2*) by a bilingual translator whose primary language is Filipino from the Sentro ng Wikang
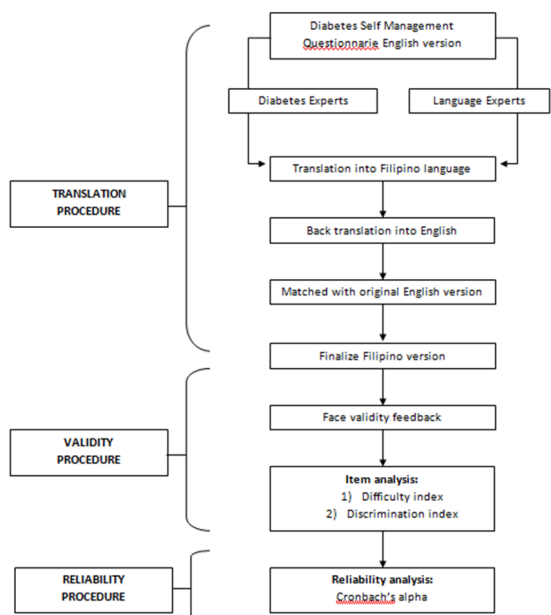

Figure 1. Psychometric Evaluation Process Flow

Filipino. This was then translated back to English by a bilingual translator, a Filipino professor from a local university, whose primary language is Filipino (*Figure 1*). The Filipino-translated questionnaire was pre-tested on 10 T2DM patients consulting at the charity outpatient clinic of ITRMC. The questionnaires were answered with ease and little assistance was needed by the patients for clarifications.

For the reliability testing of the questionnaire, patients were recruited through purposive sampling. They were then asked to answer the questionnaire in a separate quiet room. The questionnaire was administered by one of the investigators, who were present in the room for clarifications, but physically away during the time the participant accomplished the questionnaire.   Once finished, the questionnaire was handed back to the investigator. A retest was done where patients answered the questionnaire again during subsequent follow-up, the interval of which ranged from 1-2 months.

The questionnaire consisted of 16 items, seven of which were formulated positively and nine inversely regarding what is considered effective self-care. As in the DSMQ English version, a four-point Likert scale was used with the response options translated to Filipino "applies to me very much" (3 points), "applies to me to a considerable degree" (2 points), "applies to me to some degree" (1 point) and "does not apply to me" (0 point). An option of "is not required as part of my treatment" can be ticked in items 1, 4, 6, 10, and 12 to enable individual adjustments in these items which assess aspects of Self-Monitoring of Blood Glucose (SMBG) or medical treatment.

T2DM patients who came in for a consult and who fulfilled the inclusion criteria were given the questionnaires. After consenting, they were asked to rate the extent to which each statement applies to personal self-management about the previous eight weeks.

The content of the DSMQ was divided into four subscales labeled as *Glucose Management* (items 1, 4, 6, 10, 12), *Dietary Control* (items 2, 5, 9, 13), *Physical Activity* (items 8, 11, 15), and *Health-Care Use* (items 3, 7, 14). Summation to a "Sum Scale" and the estimation of four subscale scores was done. Item 16 which requests for the overall rating of self-care was included in the Sum Scale only.[10]

In the scoring of the questionnaire, negatively worded items were reversed such that higher values are indicative of more effective self-care. Scale scores were computed as sums of item scores and then transformed to a scale ranging from 0 to 10 (raw score/theoretical maximum score x 10). Thus, the transformed score of 10 represented the highest self-rating of the assessed behavior. If the "is not required as part of my treatment" option was ticked in an item, it was not used, and the theoretical maximum score was reduced by 3 points. If more than half of the items of a scale were missing, a scale score was not computed.

The latest HbA1c values from within 6 months prior to study inclusion were extracted from participants' laboratory and clinic records. If more than one HbA1c value was available in the past 6 months, the most recent value was used.

Sample Size and Data Analysis. According to a study by Anthoine et. al, sample size determination for psychometric validation studies is rarely ever justified *a priori*.[12] Most literature suggests that sample size determination is a function of the number of variables. However, this has no empirical support.[13] A sample size of 50, therefore, was adopted following the review of Barret and Kline, who showed that the minimum quantity of observations required to yield a clear, recognizable factor pattern is 50.[14]

Data analysis was performed using *SPSS 21.0.0*. Patients' demographic data were expressed as means. Categorical variables were measured as frequencies. Group comparisons involved One-way *ANOVA*, *Student's t-test*, and *Pearson's chi-squared test*. In all analyses, a *p < 0.05* (two-tailed test) was considered statistically significant.

Inter-item-correlations, corrected item total-correlations, and item difficulty indices (percentage of agreements among all responses) were computed to assess item characteristics. In addition, each item was correlated with HbA1c values. The items were analyzed for the scale's reliability coefficient (*Cronbach's Alpha*) in case of item deletion. All item analyses were based on inverted item scores.

Domain validity was assessed by categorizing patients into one of three HbA1c values as adapted from current T2DM clinical practice guidelines. Those with 7.0% and below were classified as *good glycemic control*, with values between 7.1% and 8.9% as *moderate glycemic control*, and 9.0% as *poor glycemic control*. Between–groups differences were analyzed using one–way *ANOVA* and *Scheffe test*.

Ethical Considerations. The study was conducted following the ethical standards of the institution and with the Helsinki Declaration. Written informed consent was acquired from all participants included in the study. All information gathered was strictly held confidential by the investigators. No economic or physical injury risks were associated with this study. Inclusion in the study was purely voluntary, without monetary benefit. The primary investigators shouldered all operational expenses and did not receive any compensation for this study.

Results

88 patients were screened for inclusion. Ten were excluded for any one of the following reasons: inability to read, inability to understand Filipino, poor eyesight. A total of 78 participants were able to accomplish the Filipino-translated DSMQ with subsequent extraction of their HbA1c values within the past 6 months from medical records.   None of the participants ticked the "not

Table I. Demographic Characteristics of Participants

Characteristics	Mean ± SD
Age (years)	61.99 ± 11.17
Height (meters)	1.58 ± 0.14
Weight (kg)	60.07 ± 12.28
BMI	23.92 ± 3.94
Years with T2DM	7.49 ± 6.39
HbA1c value (%)	7.76% ± 1.89
Sex	N (%)
Male	25 (32.1%)
Female	53 (67.9%)

Note: Data are n (%) or Mean ± SD.
BMI, Body Mass Index; HbA1c, glycated hemoglobin;
DSMQ, Diabetes Self-Management Questionnaire

Table II. Mean Scores per Questionnaire Subscale Domain

	Mean ± SD	Maximum Possible Raw Score Per Item	No. of Items	Scale Score* Mean ± SD
DSMQ 'Sum Scale'	2.51 ± 0.26	3	16	8.37 ± 0.88
Subscale 'Glucose Management' (GM)	2.51 ± 0.44	3	5	8.37 ± 1.48
Subscale 'Dietary Control' (DC)	2.59 ± 0.37	3	4	6.71 ± 0.92
Subscale 'Physical Activity' (PA)	2.61 ± 0.43	3	3	8.02 ± 1.95
Subscale 'Health-Care Use' (HCU)	2.41 ± 0.59	3	3	8.70 ± 1.44

Note: Data are n (%) or Mean ± SD.
*Scale Scores = sums of item scores and then transformed to a scale ranging from 0 to 10 (raw score/theoretical maximum score * 10)

Table III. Test-Retest Reliability of the DSMQ Filipino Translated

Item	Statement	Correlation Coefficient[a]	p-value
1	Check blood sugar levels with care and attention	0.79	*0.007**
2	Choose food to easily achieve optimal blood sugar	0.81	*0.004**
3	Keep recommended doctors' appointments	0.52	0.12
4	Take diabetes medication as prescribed	0.85	*0.002**
5	Occasionally eat lots of sweets/ high-carb foods	0.83	*0.003**
6	Record blood sugar levels regularly	0.76	*0.01*
7	Avoid diabetes-related doctors' appointments	0.79	*0.007**
8	Do physical activity to achieve optimal sugar levels	0.42	0.22
9	Follow specialist's dietary recommendations	0.96	*<0.001***
10	Do not check blood sugar levels frequently enough	0.85	*0.002**
11	Avoid physical activity, although good for diabetes	0.95	*<0.001***
12	Forget to take/ skip diabetes medication	0.96	*<0.001***
13	Sometimes have real 'food binges'	0.94	*<0.001***
14	Should see medical practitioner(s) more often	0.97	*<0.001***
15	Skip planned physical activity	0.85	*0.002**
16	Diabetes self-care is poor	0.70	*0.02*

[a] Spearman's Rank Correlation
Correlation is significant at the *p<0.05 level or **p<0.01 or ***p<0.001 (2-tailed); Critical Value of r = 0.304

required box" for items on self-monitoring of blood glucose (items 1,6 and 10) and T2DM medication intake (items 4 and 12),

Most of the participants were female (67.9%) with a mean age of 62 years old. The mean duration of T2DM was 7.49 years and the mean BMI was 23.9. The mean HbA1c value was 7.76% (*Table I*).

Mean scores were similar for all subscale domains, ranging from 2.41 for "Health Care Use" to 2.61 for "Physical Activity" (*Table II*). However, upon score transformation, the subscale for "Dietary Control" garnered the lowest mean score at 6.71 (± 0.92) and the "Healthcare Use" subscale garnered the highest mean score at 8.7 (±1.44).

Overall internal reliability of the Filipino-translated DSMQ was acceptable with a *Cronbach's Alpha* result of 0.75. Of the four subscales, only the subscale of "Physical Activity" showed adequate internal reliability with a *Cronbach's Alpha* of 0.62. The subscales of "Glucose Management",

Table IV. Distribution of scores, item difficulties, scale-correlations, internal consistency in case of deletion, and correlations with HbA1c of the DSMQ items

Item	Distribution of item scores	Difficulty index[a]	Item-subscale correlation[b]	Item-total correlation	Cronbach's Alpha if item is deleted	Correlation with HbA1c	p-value
1	2.59 ± 0.83	85.9	0.58	0.33	0.40	0.07	0.53
2	2.73 ± 0.48	98.7	0.45	0.32	0.39	-0.11	0.32
3	2.79 ± 0.47	97.4	0.35	0.37	0.38	-0.01	0.95
4	2.78 ± 0.53	97.4	0.33	0.37	0.38	0.01	0.96
5	2.65 ± 0.65	93.6	0.46	0.18	0.42	-0.05	0.63
6	2.40 ± 0.92	80.8	0.66	0.43	0.37	0.10	0.38
7	2.37 ± 1.07	82.1	0.75	0.33	0.42	0.05	0.65
8	2.35 ± 0.80	84.6	0.68	0.48	0.35	0.03	0.82
9	2.69 ± 0.61	92.3	0.45	0.33	0.39	-0.11	0.32
10	2.42 ± 0.92	85.9	0.47	0.24	0.43	-0.01	0.94
11	2.50 ± 0.85	87.2	0.73	0.46	0.36	0.08	0.46
12	2.36 ± 1.01	78.2	0.52	0.44	0.37	-0.03	0.82
13	2.29 ± 1.05	78.2	0.67	0.03	0.51	0.02	0.88
14	2.67 ± 0.68	93.6	0.48	0.13	0.44	0.03	0.79
15	2.37 ± 0.81	83.3	0.73	0.46	0.36	-0.10	0.38
16	2.24 ± 1.08	76.9	n/a	0.38	0.40	0.02	0.84

Note: Data are M ± SD, difficulty indices, Pearson's correlations, Cronbach's alpha or Spearman's ρ.
Correlations with HbA1c are Spearman's ρ; *p< 0.05;
[a]percentage of agreements among all responses
[b]part-whole-corrected

Table V. Comparison of the DSMQ self-care activities in patients with HbA1c ≤ 7.5, from 7.6 to 8.9, and ≥ 9.0

DSMQ self-care activities	HbA1c ≤ 7.0 (n = 34)	p-value[a]	HbA1c 7.1–8.9 (n = 26)	p-value[b]	HbA1c ≥9.0 (n = 18)	p-value[c]	ANOVA p value
Glucose Management	8.24 ± 1.45	0.74	8.54 ± 1.46	0.93	8.37 ± 1.60	0.95	0.30 (0.74)
Dietary Control	6.84 ± 0.79	0.78	6.67 ± 1.03	0.89	6.53 ± 1.00	0.52	0.71 (0.50)
Physical Activity	7.98 ± 1.80	0.93	8.16 ± 1.99	0.91	7.90 ± 2.25	0.99	0.11 (0.90)
Health-Care Use	8.43 ± 1.47	0.30	9.02 ± 1.23	0.85	8.77 ± 1.61	0.73	1.25 (0.29)
Sum Scale	8.27 ± 0.82	0.49	8.54 ± 0.91	0.74	8.33 ± 0.93	0.97	0.75 (0.48)

Note: Data are M ± SD of Scale Scores = sums of item scores and then transformed to a scale ranging from 0 to 10
(raw score/theoretical maximum score x 10)
Tests were One-way ANOVA. Significant if *p< 0.05
[a]comparison between the first and second group
[b]comparison between the second and third group
[c]rcomparison between the third and first group

"Dietary Control" and "Health Care Use" had lower results at 0.36, 0.28, and 0.25, respectively.

For the sensitivity analysis of the subscale of Dietary control, deletion of item 13 ("*Minsan, hindi talaga ako humihinto sa kakakain, kahit na wala akong hypoglycaemia*") could increase internal consistency from 0.28 to 0.51. For the subscale of "Glucose Management", deletion of item 10 ("*Hindi ko madalas na nasusuri ang aking blood sugar level na kailangan upang magkaroon ng magandang blood glucose control*") could increase internal consistency from 0.36 to 0.40, while deletion of item 14 ("*Kaugnay ng aking pangangalaga sa diyabetes,dapat madalas akong nagpupunta sa aking (mga) doctor*") could increase internal consistency from 0.25 to 0.44.

Test-retest reliability showed a statistically significant correlation (*p < 0.05*) for all items except items 3 and 8 as shown in *Table III*, while the 'Sum Scale' mean item-

subscale domain correlations were all statistically highly significant (*p < 0.001*) as shown in *Table IV*.

Known group validity was computed. Comparison of patient groups into 'good', 'medium', and 'poor' glycemic control as categorized by HbA1c levels revealed no significant differences regarding the DSMQ Sum Scores and subscale scores as shown in *Table V*.

Discussion and Recommendations

While the overall internal reliability of the scale as measured by *Cronbach's alpha* was adequate, this was not the case in the analysis of the subscales. Item 13 in the "Dietary Control" subscale may have been different from the other items in the subscale due to the explicit mention of the qualifier of not having hypoglycemia which may have been more difficult to comprehend than the other items. Item 10 in the "Glucose Management" subscale may also have been reflective of a knowledge issue as it implied that the participant had adequate

knowledge about the frequency of glucose monitoring. Item 14 in the "Healthcare Use" subscale may have been interpreted as a question as to whether this applied to people with T2DM in general.

All the items were found to be reliable except for item 3 (*Keep recommended doctors' appointments*) and item 8 (*Do physical activity to achieve optimal sugar levels*). This may indicate unstable responses across time (one to two-month intervals). However, the 'Sum Scale' and the mean item subscale correlations showed significant correlation making the questionnaire reliable.

In the known groups' analysis, there were no significant differences between patient groups with 'good', 'moderate', and 'poor' glycemic control. The questionnaire is thus not able to correlate the self-care activities to HbA1c values for this pool of patients. This finding is contrary to what was found in the English version validity study of the same tool, probably owing to the relatively smaller sample size of this study.[10]

Nevertheless, this is the first Filipino-translated questionnaire aimed at objectively measuring the self-management behaviors of diabetic patients. This has the potential of helping clinicians identify gaps in individual diabetic patients' self-management, and even T2DM program heads in determining self-management gaps in large patient groups, which can then be targeted for emphasis through individualized or group T2DM education programs.

Of note was that of the four subscales, "Dietary Control" garnered the lowest score, which may indicate that this aspect of glucose control is the one which needs additional focus on in this sample of patients. This demonstrates the practical application of this questionnaire as mentioned previously.

Some limitations of our study include not being able to include educational attainment which may be an important factor in questionnaire comprehension. Another limitation is the use of HbA1c as a sole indicator of glycemic control, which may be subject to imprecision due to non-standardized results coming from different lab facilities and the possibility of clinical confounders such as anemia, which were unexplored in this study.

Future research using this tool with a larger sample size may improve scale internal reliability and the use of other measures of glucose control such as fasting blood glucose or oral glucose tolerance test which may be better able to demonstrate its association with overall glycemic control. It is also recommended that participants' glycemic parameters are determined and processed in a single laboratory after questionnaire accomplishment may also reduce detection bias. A study looking at the association of the questionnaire with other factors influencing glucose control could also further broaden the use of the questionnaire.

Acknowledgments

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Appendix 1

English Version of the DSMQ

The ff. statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you	Applies to me very much (3)	Applies to me to a considerable degree (2)	Applies to me to some degree (1)	Does not apply to me (0)
1. I check my blood sugar levels with care and attention o Blood sugar management is not required as part of my treatment				
2. The food I choose to eat makes it easy to achieve optimal blood sugar levels				
3. I keep all doctors' appointments recommended for my diabetes treatment				
4. I take my diabetes medication as prescribed o Diabetes medication/insulin is not required as part of my treatment				
5. Occasionally I eat lots of sweets or other foods rich in carbohydrates				
6. I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter) o Blood sugar measurement is not required as a part of my treatment				
7. I tend to avoid diabetes-related doctor's appointments				
8. I do regular physical activity to achieve optimal blood sugar levels				
9. I strictly follow the dietary recommendations given by my doctor or diabetes specialist				
10. I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. o Blood sugar measurement is not required as part of my treatment				
11. I avoid physical activity, although it would improve my diabetes				
12. I tend to forget to take or skip my diabetes medication o Diabetes medication/insulin is not required as part of my treatment				
13. Sometimes I have real 'food binges' (not triggered by hypoglycemia)				
14. Regarding my diabetes care, I should see my medical practitioner(s) more often				
15. I tend to skip planned physical activity				
16. My diabetes self-care is poor				

Appendix 2

Filipino Version of the DSMQ

Ang sumusunod na mga pahayag ay naglalarawan ng gagawin sa pansariling pangangalaga kaugnay ng iyong diyabetes. Isipin ang iyong pansariling pangangalaga nitong nakaraang 8 linggo, at tiyakin kung aplikable sa iyo ang bawat pahayag.	Aplikable nang husto sa akin (3)	Aplikable sa akin sa may katindihang antas (2)	Aplikable sa akin nang ilang antas (1)	Hindi aplikable sa akin (0)
1 Sinusuri ko nang maingat at may atensiyon ang aking blood sugar level.				
o *Ang pagcheck ng blood sugar ay hindi kailangan bilang bahagi ng aking paggagamot.*				
2 Ang mga kinakain ko ay nagpapadali upang makamit ko ang pinakamagandang blood sugar level.				
3 Pinupuntahan ko lahat ng appointment ko sa doctor bilang bahagi ng aking paggagamot.				
4 Sinusunod ko ang medikasyon (halimbawa: insulin, tableta) na ibinigay sa akin.				
o *Ang medikasyon/insulin ay hindi kailangan bilang bahagi ng aking paggagamot.*				
5 Paminsan-minsan, kumakain ako ng matatamis at iba pang pagkaing mayaman sa carbohydrates.				
6 Inirerekord ko nang regular ang aking blood sugar level (o sinusuri ang value chart gamit ang aking blood glucose meter).				
o *Ang blood sugar measurement ay hindi kailangan bilang bahagi ng aking paggagamot.*				
7 Iniiwasan ko ang mga appointment sa doctor nakaugnay ng diyabetes.				
8 Gumagawa ako ng regular napisikal exercises upang makamit ang pinakamagandang blood sugar level				
9 Estrikto kong sinusunod ang mungkahi sapagdidiyeta ng aking doktor o espesyalista sa diyabetes.				
10 Hindi ko madalas na nasusuri ang aking blood sugar level na kailangan upang magkaroon ng magandang blood glucose control.				
o *Ang blood sugar measurement ay hindi kailangan bilang bahagi ng aking paggagamot.*				
11 Iniiwasan ko ang mga gawaing pisikal, kahit pa makabubuti ito sa aking diyabetes.				
12 Nakakalimutan ko o nalalaktawan ang aking medikasyon sa diyabetes (halimbawa: insulin, tableta).				
o *Ang medikasyon/insulin ay hind kailangan bilang bahagi ng aking paggagamot.*				
13 Minsan, hindi talaga ako humihinto sa kakakain (kahit na wala akong hypoglycaemia).				
14 Kaugnay ng aking pangangalaga sa diyabetes,dapat madalas akong nagpupunta sa aking (mga) doktor.				
15 Nilalaktawan ko ang nakaplano ng gawaing pisikal.				
16 Hindi maayos ang aking pansariling pangangalaga sa diyabetes.				