

The Psychometric Properties of the Armenian Version of Diabetes Self-Management Questionnaire (DSMQ)

Master of Public Health Integrating Experience Project
A Research Grant Proposal

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Abstract

Background: Globally, non-communicable diseases (NCDs) are among the leading causes of death with the majority of NCD-related deaths reported in low- and middle-income countries. In 2016, the NCD-related premature death rate in Armenia was 29%. Hyperglycemia is one of the major risk factors of NCDs that can lead to several life-threatening outcomes when not treated. Behavioral factors can have a significant effect on achieving acceptable glycated hemoglobin (HbA_{1c}) levels in diabetics. To investigate this relationship, it is more than essential to have an instrument measuring behavioral aspects of patients that could be directly related to their HbA_{1c} levels. Currently, there is no validated Armenian-language instrument with these properties.

Diabetes Self-Management Questionnaire (DSMQ) is an instrument that measures those aspects.

Aim: This study aims to translate DSMQ to Armenian and evaluate its psychometric properties in Armenians diagnosed with diabetes mellitus.

Methods: A descriptive cross-sectional study will be done among 168, randomly selected diabetics who are registered in the Yerevan Urban Endocrine Dispensary. DSMQ has undergone a formal translation into Armenian with two forward and two backward translations. Participants will be asked (through phone interviews) to complete the translated DSMQ twice with the two interviews seven days apart. Data obtained from the completed DSMQs will then be entered into “IBM SPSS Statistics 21” statistical software to be analyzed. The reliability of the translated scale will be assessed by measuring its internal consistency (Cronbach’s α coefficient) and test-retest reliability (Kappa statistics calculation). The convergent validity of the translated scale will be assessed through calculating Pearson’s correlation coefficient between the subscales scores of

the translated DSMQ and the relevant underlying measures (HbA_{1c}, BMI and health services utilization).

Ethical Considerations: The study protocol has been reviewed and approved by the Institutional Review Board (IRB) of the American University of Armenia.

Logistic Considerations: The study will take around two months to be completed and the estimated cost of the study is 1,547,200 AMD (approximately 3100 USD).

1. Specific Aims

Based on the literature review, we could not find a reliable questionnaire that assesses diabetes self-management in Armenia. Hence, DSMQ was identified as the most suitable questionnaire to be adapted and used in Armenia because it takes into account the most essential aspects of diabetes self-management and is user-friendly with short, clear, and focused questions. The cross-cultural adaptation of an instrument is essential when it is used in a different culture, setting, and language to minimize the risk of bias when it is used in a study.¹ This study aims to translate DSMQ to Armenian and evaluate its psychometric properties in Armenians diagnosed with type 2 diabetes mellitus. Research grant proposal framework will be used. The study has the following objectives:

- a) To examine the construct validity of the Armenian version of DSMQ by assessing the convergent validity of the subscales (domains) of the DSMQ questionnaire against the relevant underlying measures (glycated hemoglobin level, BMI and healthcare utilization).
- b) To examine the internal consistency of the Armenian version of DSMQ by calculating its Cronbach's α coefficient and corrected item-total correlations.
- c) To examine the test-retest reliability of the Armenian version of DSMQ when repeated on the same sample at two different times.

2. Introduction

2.1 Background

Non-communicable diseases (NCDs) cause most death globally, accounting for more than 70% (41million) of the total deaths worldwide.² Around 75% of NCD-related deaths occur in low and middle-income countries.³ Armenia, which is a high-middle-income country, also

suffers from the economic and health burden of NCDs. In 2016, NCDs accounted for 80% of deaths and the premature death rate related to NCDs was 29% in Armenia.⁴ Moreover, 40% of lost DALYs in Armenia were due to cardiovascular diseases and an additional 10% were due to diabetes (2016).⁵ In addition to the health burden, NCDs have cost 362.7 billion Armenian drams in 2017 which represents 6.5% of the country's GDP.⁴ Like any other disease, NCDs have several risk factors. High blood glucose concentration (hyperglycemia) is one of the major risk factors that, when untreated, could lead to several life-threatening complications such as irreversible damage to some vital organs like the eyes, kidneys, heart, nerves, and peripheral vascular system.⁶ Although NCD prevention and control is a priority for the government of Armenia,⁷ certain gaps in the literature that could help to better understand barriers for utilization of free screenings and management of diabetes in Armenia are present. According to the International Diabetes Federation (IDF), diabetes mellitus (DM) is one of the leading global health emergencies of the 21st century with around 463 million diagnosed with it and 90% of whom have type 2 DM in 2019.⁸ In Armenia, a study conducted in 2016 showed that 19% of the population aging above 35 years had high levels of blood glucose (above 6.1 mmol/l).⁴

2.2 The Diabetes Self-Management Questionnaire

Multiple internal and external factors (such as medical advice, metabolic control, developmental stage, etc.) affect the level of blood glucose.⁹ However, behavioral factors can have a significant impact on limiting complications of both, type 1 and 2 diabetes, and proper self-management by diabetics is essential for achieving acceptable blood glucose levels.^{10,11} The association between negative emotional state and both, reduced self-care activities and elevated HbA_{1c} (glycated hemoglobin) have been reported in several studies.^{12,13,14,15,16} However, very limited work has been done to assess the relationship between behaviors and hyperglycemia.

Several studies have shown that self-care is significantly associated with the levels of HbA_{1c} in diabetics.^{17,18,19,20,21,22} In order to properly investigate this relationship, a measuring instrument having items that could be directly associated with HbA_{1c} is critical. The Diabetes Self-Management Questionnaire (DSMQ) is a brief instrument that was developed to assess HbA_{1c} related self-care behaviors through clinical trials that include data collection.²³ Such questionnaires usually have two major goals when used in studies: first, they aim to uncover misunderstandings about recommended treatments, and second, they help doctors to evaluate the adherence of patients to treatments aimed at better glycemic control.²⁴ DSMQ could also be used for the clinical assessment of patients with diabetes and research on the assessment of factors affecting the association between glycemic control and self-management behaviors.²⁵ The self-management behavioral domains measured by DSMQ are glucose management, dietary control, physical activity, and healthcare use.²³ In its psychometric evaluation, DSMQ demonstrated a good internal consistency with a Cronbach's alpha of 0.84 and was considered as a valid questionnaire.²³ Furthermore, the Hungarian,²⁶ Urdu (Cronbach's alpha=0.96)²⁷ and Thai (Cronbach's alpha=0.73)²⁸ versions of DSMQ showed high validity and reliability. The subscales; "Glucose Management", "Dietary Control" and "Health-Care Use" were significantly correlated with HbA_{1c} with correlation coefficients of -0.39, -0.30, and -0.22, respectively.²³

3. Methods

3.1 Instrument

The DSMQ was designed at the Research Institute of the Diabetes Academy Mergentheim, Germany. It consists of 16 items that are formulated as behavioral descriptions and written in the first-person form. Interviewees are asked to evaluate the application of each statement to their self-management behavior in the previous eight weeks. This time frame was selected taking into

consideration the time-dependence of HbA_{1C} values.^{29,30} All 16 items are designed to be evaluated through a four-point ordinal scale that avoids neutral responses. The response options are; “applies to me very much” (three points for positively formulated and no points for inversely formulated items), “applies to me to a considerable degree” (two points for positively formulated and one point for inversely formulated items), “applies to me to some degree” (one point for positively formulated and two points for inversely formulated items), and “does not apply to me” (no points for positively formulated and three points for inversely formulated items). Seven of the sixteen items are formulated positively and nine items are formulated inversely with respect to effective self-care. DSMQ has a “Sum Scale” score and four subscale scores. The four subscales are labelled “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). The sixteenth item, which assesses the overall rating of self-care is only included in the “Sum Scale”. Scoring of the DSMQ will be done through summing up the scores of all 16 items after reversing the scores of nine inversely formulated items (so that higher scores result to better self-care). In addition to the sixteen DSMQ questions, items on respondent’s current weight and height and health services utilization were included into the instrument to assess the domains (BMI and health services utilization) potentially related to DSMQ subscales of “Dietary Control” / “Physical Activity” and “Healthcare Use”, respectively. Additionally, items asking about respondent’s main demographic characteristics (e.g., age, gender, education) and possession of personal glucometer, the EQ-5d-5L 5-item quality of life measuring scale³¹ (Armenian version) and two questions taken from a previous study instrument³² that ask about respondent’s perceived social support were included in the questionnaire to enable stratified analysis of psychometric properties of DSMQ scale and its subscales.

3.2 Translation

A standardized forward and backward translation was done to translate the English version of DSMQ into Armenian.³³ DSMQ was first forward translated into Armenian by two independent translators who were familiar with survey design but not DSMQ. After that, the two translations were reviewed and matched to a single final forward translation by a bilingual expert group who had previous experience in translating and validating research instruments in Armenia. This was done for clarity, common language use, and conceptual equivalence, and after evaluation, all identified issues/disputes were resolved. The final product of the forward translation was back-translated by two native English-speaking translators who were not familiar with DSMQ. The expert group reviewed and matched the backward translations into a single final backward translation (Appendix 1). Backward translation was done to identify any discrepancies between the original and the translated questionnaires and to assess the equivalence of the translated version with the original one.³⁴ Finally, the Armenian version of DSMQ was labeled as DSMQ-Am (Appendix 2).

3.3 Design and Sample Size

The proposed study will be a cross-sectional survey. Sampled participants will be contacted through phone calls in which the socio-demographic data will be collected and DSMQ-Am will be completed. This will be done because of the pandemic situation and participants belonging to a high-risk group.³⁵ After completing the questionnaire, another phone meeting, after seven days from the first one, will be done with the participants for the completion of the questionnaire for the second time. The sample size was calculated using an excel sheet developed for the sample size calculation of test-retest reliability and intraclass correlation^{36,37} with the following assumptions: two observations will be obtained from each participant, 0.7 is

the acceptable reliability, 0.8 is the expected reliability and the dropout is 30%. Although a previous cross-sectional survey assessing the test-retest reliability of a questionnaire³⁸ had a dropout rate of 43%, after thorough discussion, the research team has accepted the dropout rate to be 30% because the participants of the previous survey performed in Armenia were terminally ill unlike the participants of this survey. Conventional alpha of 0.05 and power of 0.80 was used in the sample size calculation. The final calculated sample size adjusted for the dropout rate described above was 168 participants. (Appendix 3)

3.4 Setting and Sampling

The study will be conducted in Yerevan, Armenia. The target population of the study will be Armenian adults (aged 18 and above) who are diagnosed with diabetes for at least one year, who understand Armenian and do not have severe cognitive impairment or impairment of hearing that could affect their understanding of the study.²⁸ The sampling of the target population will be done through simple random sampling. The Yerevan Urban Endocrine Dispensary will be asked to provide the phone numbers and the latest HbA_{1C} levels of 168 randomly selected patients with diabetes.

3.5 Implementation

After the process of translation, the translated questionnaires were pre-tested on six diabetic individuals through thorough discussions of items to identify any clarification needs and misunderstanding issues before their use in the study. The study will consist of two parts. In the first part, the interviewer will ask the questions in the DSMQ-Am, followed by the next parts of the questionnaire (items on QOL, Social Support, Health Services Utilization, and Respondent Data) and complete the questionnaire. In the second part of the study, the interviewer will only ask the questions in the DSMQ-Am to participants and complete it for the second time.

3.6 Sources of Data

The results of the first phase of the study, together with the socio-demographic, personal (including weight and height), QOL, social support and health services utilization information, will be collected through the completed DSMQ-Am. The results of the second stage of the study will be obtained from the second completion of the DSMQ-Am. The HbA_{1C} levels of participants will be obtained from the Yerevan Urban Endocrine Dispensary. All data will be entered and analyzed in IBM SPSS Statistics 21.

3.7 Analysis

Exploratory data analysis for data cleaning purposes will be done by checking for outliers (strange values), missing values, and analyzing the distribution of variables. Data cleaning will be done by comparing unexpected values with DSMQ-Am questionnaires to eliminate any data entry errors.

Convergent Validity

To assess the convergent validity of the translated questionnaire, Pearson's correlation coefficient will be calculated between:

- a- "Glucose Management" subscale scores and HbA_{1C} levels.
- b- "Dietary Control" subscale scores and BMI values.
- c- "Physical Activity" subscale scores and BMI values.
- d- "Health-Care Use" subscale scores and healthcare utilization scores.

The following criteria will be used in the interpretation of correlations: "little or no correlation" (0-0.25), "fair correlation" (0.251-0.5), "good correlation" (0.51-0.75), and "excellent correlation" (> 0.75).³⁹

Internal Consistency

The internal consistency of DSMQ will be assessed by calculating Cronbach's α coefficient, which will be appraised as: " $> 0.90 =$ Excellent, $0.80-0.89 =$ Good, $0.70-0.79 =$ Acceptable, $0.60-0.69 =$ Questionable, $0.50-0.59 =$ Poor and $<0.50 =$ Unacceptable."⁴⁰ Moreover, item means, corrected item-total correlations and item-subscale correlations will be calculated to evaluate item characteristics.^{40,41}

Test-retest Reliability

After the collection of both (from the first and second interviews) questionnaires, the results will be compared. Items having the same response will be considered as concordant and items having different responses will be considered as discordant. A score of one will be provided for concordant items and a score of zero will be provided for discordant items. Kappa statistics will be calculated for DSMQ-Am to analyze the agreement level between first and second administration results beyond that expected by chance. The results of the Kappa statistics will be appraised as: " $\leq 0 =$ no agreement, $0.01-0.20 =$ non to slight, $0.21-0.40 =$ fair, $0.41-0.60 =$ moderate, $0.61-0.80 =$ substantial, $0.81-1.00 =$ almost perfect".⁴²

4. Ethical Considerations

Participation in this study will be completely voluntary and will require oral informed consent (Appendix 4). Any participant will be free to opt out of the study at any time in which he/she decides to do so. Our study received ethical approval from the Institutional Review Board (IRB) of the American University of Armenia (PROTOCOL #: AUA-2021-007) (Appendix 5). Furthermore, the personal information collected from participants will be confidential and not shared with anyone by the research team. The personal information of participants will also be

kept in a separate file, a journal form (Appendix 6), and each participant will be provided with an ID number.

5. Logistical Considerations, Budget and Timeline

Interviewing and data collection will be done by four interviewers who will be trained by the research team in order to properly conduct the phone interviews. Data analysis will be done by the researcher investigator who is an MPH candidate at the Turpanjian School of Public Health at the American University of Armenia. The student investigator will work under the guidance of the advisors of the thesis project. The data collection, data entry, analysis, and report writing will take approximately two months. Table 1 includes the detailed timeline of the survey tasks. The estimated budget of the project will be 1,547,200 AMD with details included in table 2.

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Tables

Table 1: Study Timeline

Study Implementation						
Days	1-7	8-14	15-21	22-28	29-49	50-60
Training of Interviewers	X					
First Interviews		X				
Second Interviews			X			
Data Entry				X		
Data Analysis					X	
Report Writing						X

Table 2: Study Budget

Item	Type of Salary	Number of Units	Unit Cost (AMD)	Total (AMD)
Study Coordinator	Monthly	2	200,000	400,000
Interviewer	Per interview	336	2,000	672,000
Office Rent	Monthly	2	120,000	240,000
Printing	Per item	336	100	33,600
Phone Call	Per minute	6,720	30	201,600
Grand Total				1,547,200

Appendices

Appendix 1: Back-translated DSMQ

Diabetes self-management questionnaire

ID number:

Date: ... /... /.....

HbA_{1c} level:

I- DSMQ: Diabetes self-management questionnaire

The following statements are about how a person ensures their own personal care in case of diabetes. Reflecting on the personal care you have ensured for yourself over the past 8 weeks, please indicate to what extent each of these statements is consistent with your behavior.

	Completely matches my behavior	Highly matches my behavior	To some extent matches my behavior	Not at all matches my behavior
1- I thoroughly and carefully check my blood sugar level. <input type="checkbox"/> (99) My treatment does not require a blood sugar level measurement.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
2- I choose foods that help me achieve the desired blood sugar level.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
3- I make it to all my doctor's appointments as directed by my diabetes treatment plan.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
4- I take my diabetes medication (for example insulin, pills) as it is prescribed. <input type="checkbox"/> (99) My treatment does not include diabetes medication or insulin intake.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
5- From time to time, I eat a lot of sweets or other carbohydrate-rich foods.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
6- I regularly record my blood sugar measurement results (or I explore the measurement results chart of my glucometer). <input type="checkbox"/> (99) My treatment does not require blood sugar level measurements.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
7- I tend to avoid visiting doctors who treat diabetes.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

	Completely matches my behavior	Highly matches my behavior	To some extent matches my behavior	Not at all matches my behavior
8- I exercise regularly to achieve the desired blood sugar level.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
9- I strictly follow the advice of my doctor or diabetes specialist regarding my diet.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
10- I do not check my blood sugar often enough to have properly controlled m blood sugar level. <input type="checkbox"/> (99) My treatment does not require blood sugar measurements.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
11- I avoid physical exercise; however, it can be helpful in terms of the course of diabetes.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
12- I tend to forget or skip taking my diabetes medications (such as insulin pills). <input type="checkbox"/> (99) My treatment does not include diabetes medication or insulin intake.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
13- Sometimes I eat too much (not as a result of hypoglycemia).	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
14- As for my treatment, I need to visit my diabetes doctor (s) more frequently.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
15- I frequently miss my planned physical exercises.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
16- My personal diabetes care is insufficient.	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

Appendix 2: Survey Instrument

Questionnaire about Diabetes Self-Management

ID number:

Survey Date: .../.../.....

HbA_{1c} level:

I- DSMQ

The following 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. <input type="checkbox"/> (99) Blood sugar measurement is not required as a 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 (e.g., insulin, tablets) as prescribed. <input type="checkbox"/> (99) Diabetes medication/insulin is not required as a part of my treatment.				
5- Occasionally I eat lots of sweets or other foods rich in carbohydrates.				

	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)
6- I record my blood glucose levels regularly (or analyze the value chart with my blood glucose meter). <input type="checkbox"/> (99) Blood sugar measurement is not required as a part of my treatment.				
7- I tend to avoid diabetes-related doctors' appointment				
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. <input type="checkbox"/> (99) Blood sugar measurement is not required as a 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 (e.g., insulin tablets). <input type="checkbox"/> (99) Diabetes medication/insulin is not required as a 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.				

II- Health Related Quality of Life.

Please, indicate whether you have any problems with conducting the following daily activities by choosing the most suitable response option for each of these activities.						
#		No problems	Slight problems	Moderate problems	Severe problems	Unable to do
17	Walking about	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
18	Washing or dressing yourself	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
19	Doing your usual activities (e.g. work, study, housework, family or leisure activities)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
Please, indicate how much have you felt the following during the last 30 days:						
#		None	Slight	Moderate	Severe	Extreme
20	Pain or discomfort	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
21	Anxious or depressed	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

III- Social Support.

Please, indicate:	Not at all	A little	Moderately	Very much	Extremely
22. How alone do you feel in your life?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
23. To what extent can you count on your friends and relatives when you need them?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

IV- Health Services Utilization

	Yes	No
24. Was there a time in the past two months when you felt that you needed to go to a doctor, but you did not?	<input type="checkbox"/> 0	<input type="checkbox"/> 1
25. During the last 12 months, did you visit a polyclinic (ambulatory, health post) for preventive services (help to avoid getting sick in future)?	<input type="checkbox"/> 1	<input type="checkbox"/> 0
26. Have your feet been examined for sores or irritations in the last year?	<input type="checkbox"/> 1	<input type="checkbox"/> 0
27. Have you had an eye exam in the last year?	<input type="checkbox"/> 1	<input type="checkbox"/> 0

V- Participant Information

28. Gender (*Do not read this question*)

- Male Female

29. What was your age at your last birthday? (years)

30. Please, specify the highest education level that you have received.

- Incomplete secondary (less than 10 years)
 Secondary (10-12 years: high school)
 Vocational (12-13 years)
 University level
 Post-graduate

31. How many years ago were you diagnosed with diabetes?
..... (years)

32. What type of anti-diabetic therapy do you receive?

- Exclusively insulin
 Insulin combined with oral hypoglycemic agents
 Oral hypoglycemic agents only
 Neither insulin nor hypoglycemic agents

33. Please, mention your current weight kg

34. Please mention your height cm

35. Do you have your own glucometer?

- Yes No

36. If yes, is it easy for you to get strips for measuring your blood glucose level?

- Yes Not Always No

Հարցաթերթի կ 2 արարայի ն դիաբետի ի ն ք ն ախն ամ ք ի վ երարերյ ալ

S արբ երակ ման համար՝

Հարց ման ամսաթիվ՝ /..... /.....

HbA_{1c}-ի մակարդակ՝

I- DSMQ: Շարարայի ն դիաբետի ի ն ք ն ախն ամ ք ի հարցաշար (ՇԴԻՀ)

Հետևյալ պնդումներն այն մասին են, թե մարդն ինչպես է ապահովում իր անձնական խնամքը դիաբետի ժամանակ: Մտածելով անցած 8 շաբաթվա ընթացքում Ձեր իրական ցրած անձնական խնամքի մասին, խնդրում եմ նշեք, թե որքանով է այս պնդումները յուրաքանչյուրը համընկնում Ձեր վարքագծին:

	Լինվին համընկնում է իմ վարքագծին	Չգալի չափով համընկնում է իմ վարքագծին	Որոշ չափով համընկնում է իմ վարքագծին	Ամենևին չի համընկնում իմ վարքագծին
1- Ես <i>խնամք</i> ն ու շարիր ստուգում եմ իմ արյան մեջ շաբաթի մակարդակը: <input type="checkbox"/> (99) Իմ բուժումը չի պահանջում արյան մեջ շաբաթի մակարդակի չափում:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
2- Ես ընտրում եմ այն պիսի սնունդ, որը նպաստում է հասնել արյան մեջ շաբաթի ցանկալի մակարդակի:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
3- Ես կատարում եմ բոլոր նշանակված այցելությունները բժշկին՝ այնպես, ինչպես ցուցված է դիաբետի բուժման պլանով:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
4- Ես ընդունում եմ դիաբետի մ դեղերը (օրինակ՝ ինսուլին, հարեր) այնպես, ինչպես նշանակված է: <input type="checkbox"/> (99) Իմ բուժումը չի ներառում դիաբետի դեմ դեղորայքի կամ ինսուլինի ընդունում:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
5- Ժամանակ առ ժամանակ ես մեծ քանակությամբ քաղցրեղեն եմ ուտում կամ ամսաքրեքով հարուստ ալյուրոն:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
6- Ես <i>կանոնավոր</i> սպեւ գրանցում եմ իմ արյան շաբաթի չափման արդյունքները (կամ	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

	Լինվին համընկնում է իմ վարքագծին	Զգալի չափով համընկնում է իմ վարքագծին	Որոշ չափով համընկնում է իմ վարքագծին	Ամեննին չի համընկնում իմ վարքագծին
<p>նուսումնասիրում եմ գլխում կոմե տրիս չափումները արդյունքները աղյուսակը):</p> <p><input type="checkbox"/> (99) Իմ բուժումը չի պահանջում արյան մեջ շաքարի մակարդակի չափում:</p>				
<p>7- Ես հակված եմ խուսափել շաքարային դիաբետի բժշկներին այցելելուց:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
<p>8- Ես կանոնավորապես կատարում եմ ֆիզիկական վարժություններ՝ արյան մեջ շաքարի ցանկալի մակարդակի հասնելու համար:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
<p>9- Ես խստորեն հետևում եմ սննդակարգի վերաբերյալ բժշկի կամ շաքարային դիաբետի մասնագետի տված խորհուրդներին:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
<p>10- Ես բավականաչափ հաճախ չեմ ստուգում իմ արյան շաքարի մակարդակը, որպեսզի կատարվի արյան մեջ շաքարի մակարդակի պատշաճ հսկողություն:</p> <p><input type="checkbox"/> (99) Իմ բուժումը չի պահանջում արյան մեջ շաքարի մակարդակի չափում:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
<p>11- Ես խուսափում եմ ֆիզիկական վարժություններից, թեև դա կարող է օգտակար լինել շաքարային դիաբետի ընթացքի առումով:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
<p>12- Ես հակված եմ մոռանալ կամ բաց թողնել դիաբետի դեմ դեղերի (օրինակ՝ ինսուլինի հաբերի) ընդունումը:</p> <p><input type="checkbox"/> (99) Իմ բուժումը չի ներառում դիաբետի դեմ դեղորայքի կամ ինսուլինի ընդունում:</p>	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

	Լինվին համընկն ում է իմ վարքագծի ն	Զգալի չափով համընկն ում է իմ վարքագծի ն	Որոշ չափով համընկն ում է իմ վարքագծի ն	Ամենևին չի համընկն ում իմ վարքագծի ն
13- Երբեմն ես չափազանց շատ եմ նւտում (ոչ հիպոգլիկեմիայի պատճառով):	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
14- Ինչ վերաբերում է իմ բուժմանը, ես պետք է ավելի հաճախ այցելեմ դիաբետի իմ բժշկին (բժիշկներին):	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
15- Ես հաճախ բաց եմ թողնում պլանավորված ֆիզիկական վարժույթը նույնպես:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
16- Շաքարային դիաբետի հետ կապված իմ անձնական խնամքը անբավարար է:	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

II- Առողջ ու թյանը վերաբերող կյանքի որակը

Խնդրում եմք նշել, թե հետևյալ առօրյա գործողությունները կատարելու հետ կապված ի՞նչ աստիճանի դժվարություններ ունեք 'Դուք':

#		Ոչ մի դժվարություն	Թեթև դժվարություն	Միջին դժվարություն	Մեծ դժվարություն	Ի վիճակի չեմ կատարել
17-	Քայլել	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
18-	Լվացվել կամ հագնվել	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
19-	Կատարել առօրյա գործեր (աշխատանքի, ուսման, տան կամ ժամանցի հետ կապված)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

Նշեք, ինչպես, վերջին 30 օրվա ընթացքում դուք ի՞նչ չափով եք գգացել,

#		Ոչ մի	Թեթև	Միջին	Ուժեղ	Ծայրահեղ
20-	Ցավ կամ անհարմարավետություն	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
21-	Տագնապ կամ ընկճվածություն	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

III- Սոցիալական աջակցություն

Նշեք, ինչպես.	Ամենևին	Մի քիչ	Միջին չափով	Շատ	Չափազանց
22- Որքան միայնակ եք գգում ձեզ կյանքում:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
23- Ի՞նչ չափով կարող եք հույս դնել ձեր ընկերների կամ բարեկամների վրա, երբ նրանց կարիքն ունենաք:	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

IV- Առողջ սպասակամ ծառայությունների օգտագործում

	Այն	Ոչ
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24- Վերջին 2 ամսվա ընթացքում եղե՞լ են դեպքեր, երբ կարիք եք ունեցել դիմել ու բժշկի, քայքայող չեք դիմել :	<input type="checkbox"/> 0	<input type="checkbox"/> 1
25- Վերջին մեկ տարվա ընթացքում այցելե՞լ եք բժշկի՝ կանխարգելիչ նպատակով (որպեսզի հետագայում չհիվանդանաք):	<input type="checkbox"/> 1	<input type="checkbox"/> 0
26- Վերջին մեկ տարվա ընթացքում հետազոտվե՞լ եք ունաթաթերի խոցերի կամ բորբոքված ության հայտնաբերման համար :	<input type="checkbox"/> 1	<input type="checkbox"/> 0
27- Վերջին մեկ տարվա ընթացքում անցե՞լ եք աչքի հետազոտություն :	<input type="checkbox"/> 1	<input type="checkbox"/> 0

V- Մասնակցի տվյալներ

28-Նշեք Ձեր սեռը. 1 Արական (բարձրագույն և չկարող)
2 Իգական

29-Ձեր վերջին ծննդյան օրը քանի՞ տարեկան դարձաք: տարեկան

30-Նշեք ամենաբարձր կրթությունը, որ ստացել եք.

- 1 Թերիմիջնակարգ (10 տարուց քիչ)
- 2 Միջնակարգ (10-12 տարի)
- 3 Միջին մասնագիտական (12-13 տարի)
- 4 Ինստիտուտ/համալսարան
- 5 Հետդիպլոմային/ասպիրանտուրա

31-Քանի՞ տարի առաջ է Ձեզ մոտախոտորոշվել շաքարային դիարետ: տարի

32-Ինչպիսի՞ հակադիարետային բուժում եք ստանում:

- 1 Միայն ինսուլին
- 2 Ինսուլին և հիպոգլիկեմիայի դեղեր
- 3 Միայն հիպոգլիկեմիայի դեղեր
- 4 Ոչ ինսուլին, ոչ հիպոգլիկեմիայի դեղեր

33-Նշեք Ձեր ներկայիս քաշը.կգ

34-Նշեք Ձեր հասակը.սմ

35-Դուք ունե՞ք Ձեր սեփական գլյուկոզի մետրը: 1 Այո
2 Ոչ

36-Ձեզ համար հե՞շտ է ձեռք բերել ստրիկնեթ՝ Ձեր արյան գլյուկոզային մակարդակը չափելու համար:

- 1 Այո
- 2 Ոչ միշտ
- 3 Ոչ

Appendix 3: Sample size calculation (Excel Sheet)

Sample size calculation – ICC

Observation/Subject (n)	2
Significant level (α)	0.050
Power ($1-\beta$)	0.800
Acceptable reliability (ρ_0)	0.70
Expected reliability (ρ_1)	0.80
Drop-out	30%

Sample size	117
Corrected Sample size	168

Appendix 4:

American University of Armenia

Institutional Review Board #1

Consent Form for Participants

Hello, my name is Koko Kelenjian. I am a student at the Turpanjian School of Public Health at the American University of Armenia and as part of my thesis project, which is a research project, we want to translate and check if the Diabetes Self-Management Questionnaire could be used to assess the behaviors of diabetics in managing their disease in Armenia.

I received your contact from (name of polyclinic). I am inviting you to participate in an interview for this project because you are diabetic and I would like you to share your diabetes self-management activities. Your participation will only involve two interviews. The first interview will last around 10 to 15 minutes. To conduct the second interview, I will contact you 7 to 14 days later which will be even shorter. The questions I would like to ask will be about your diet, physical activity, diabetes management, healthcare use, quality of life and the support you receive in managing your diabetes. Moreover, in the second interview I will only ask a part of those questions. You will be one of approximately 160 people who participate in this project.

All the information given by you will stay confidential. Your name will not be written anywhere, and only the summary of the data from all interviews will be presented in the final report. Every effort will be made to protect the confidentiality of the information provided insofar as it is possible. All personal identifiers such as... (e.g., your name, contact information...) will be destroyed after the completion of the research project.

Your participation in this study is voluntary. You may refuse to answer any of the questions or can stop the interview at any time. There is no financial compensation or other personal benefits from participating in the study and there are no known risks to you resulting from your participation in the study. Your decision to participate or refuse will not affect your future access to medical services at ... polyclinic. However, by agreeing to participate, you can help future studies to better understand the causes of the increasing burden of diabetes in Armenia. Hence, better interventions could be done to improve the disease status in Armenia.

If you have any questions regarding this study, you can call the Co-Investigator of this study Dr. Anahit Demirchyan (374-60 612562). If you have not been treated fairly or think you have been hurt by joining the study, you should contact Ms. Varduhi Hayrumyan, the Human Protections Administrator of the Institutional Review Board of the American University of Armenia (374-60 612561).

Do you agree to participate? Thank you. If yes, shall we continue?

Հայաստանի ամերիկյան համալսարան
Գիտական էթիկայի թիվ մեկ հանձնաժողով
Իրազեկ համաձայնության ձև

Բարև Ձեզ: Իմ անունը Գոգո Գրլըճյան է: Ես սովորում եմ Հայաստանի Ամերիկյան համալսարանի Թրփանճեան հանրային առողջապահության ֆակուլտետում: Իմ հետազոտական թեզի շրջանակներում մենք նպատակ ունենք անգլերենից թարգմանել «Դիաբետի ինքնախնամքի հարցաշարը» և ստուգել, թե արդյո՞ք այն կարող է օգտագործվել Հայաստանում՝ գնահատելու համար շաքարային դիաբետով հիվանդների վարքագիծը՝ իրենց հիվանդությունը վերահսկելու հարցում:

Ձեր հեռախոսահամարն ինձ տրվել է պոլիկլինիկայից, որտեղ Դուք հսկողության տակ եք որպես դիաբետով հիվանդ: Ես խնդրում եմ, որ այս հետազոտության շրջանակներում Դուք մասնակցեք հարցազրույցի և պատասխանեք մի քանի հարցի՝ Ձեր դիաբետի ինքնախնամքի վերաբերյալ: Եթե համաձայնեք մասնակցել, Ձեր մասնակցությունը կսահամանափվի երկու հարցազրույցով: Առաջինը կտևի 10-15 րոպե, իսկ երկրորդը կլինի ավելի կարճատև և տեղի կունենա այս հարցազրույցից 7-ից 14 օր հետո: Հարցերը, որոնք ուզում եմ Ձեզ տալ, վերաբերում են ձեր սննդակարգին, ֆիզիկական ակտիվությանը, կյանքի որակին, դիաբետի վերահսկմանը և այդ հարցում Ձեր ստացած աջակցությանը, ինչպես նաև՝ բժշկական ծառայություններից Ձեր օգտվելուն: Այս հարցերի միայն մի մասը կներառվի երկրորդ հարցազրույցում: Դուք մեկն եք 160 մասնակիցներից, ովքեր պատահականության սկզբունքով ընտրվել են՝ այս հետազոտությանը մասնակցելու համար:

Ուզում եմ տեղեկացնել, որ Ձեր կողմից տրամադրված տեղեկությունները գաղտնի կպահվեն, Ձեր անունը չի հրապարակվի կամ հիշատակվի ոչ մեկ տեղ, իսկ այս հետազոտության ընթացքում ձեռք բերված տեղեկությունները կներկայացվեն միայն ամփոփ զեկույցի ձևով: Ձեր տված տեղեկությունների գաղտնիությունը կպահովվի բոլոր հնարավոր միջոցներով: Բոլոր անձնական տվյալները, ինչպիսիք են Ձեր անունը կամ հեռախոսահամարը, կջնջվեն ծրագրի ավարտից հետո:

Այս հետազոտությանը Ձեր մասնակցությունը կամավոր է: Դուք կարող եք բաց թողնել այն բոլոր հարցերը, որոնց չեք ցանկանա պատասխանել կամ դադարեցնել հարցազրույցը ցանկացած պահի: Ձեր մասնակցությունն այս հարցազրույցին որևէ ռիսկի չի պարունակում, բայց և՛ չի հանգեցնի որևէ անմիջական օգուտի՝ Ձեզ համար: Ձեր մասնակցությունը կամ դրանից հրաժարումը որևէ կերպ չեն ազդի Ձեր հետագա բուժապասարկման վրա . . . պ ո լ ի կ լ ի ն ի կ ա յ ու մ : Սակայն Ձեր մասնակցությամբ Դուք կնպաստեք, որ Հայաստանում ավելի լավ հասկացվեն տիպաբանական աճի պատճարները և մշակվեն արդյունավետ միջոցառումներ՝ շաքարային դիաբետի բարդությունները նվազեցնելու համար:

Այս հետազոտության վերաբերյալ հարցերի դեպքում կարող եք զանգահարել հետազոտության համահեղինակ՝ դոկտոր Անահիտ Դեմիրճյանին (+374-60-61-25-62 հեռախոսահամարով): Եթե կարծում եք, որ այս հետազոտության շրջանակներում Ձեզ հետ ճիշտ չեն վարվել, կամ որևէ կերպ Ձեզ վիրավորել են հարցազրույցների ընթացքում, կարող եք դիմել Հայաստանի ամերիկյան համալսարանի գիտահետազոտական էթիկայի համակարգող՝ Վարդուհի Հայրումյանին (+374-60-61-25-61 հեռախոսահամարով):

Դուք համաձայն եք մասնակցել:

Եթե այո, շնորհակալ եմ: Կարո՞ղ ենք սկսել:

Appendix 5: IRB approval



AUA American University
of Armenia

April 16, 2021

PRINCIPAL INVESTIGATOR: Vahe Khachadourian, MD, MPH, PHD
CO-INVESTIGATOR(S): Anahit Demirchyan, MD, MPH
STUDENT INVESTIGATOR(S): Koko Kelenjian, BS, MPH(c)

TITLE: The Psychometric Properties of the Armenian Version of Diabetes Self-Management Questionnaire (DSMQ)

PROTOCOL #: AUA-2021-007

Via Email: vkachadourian@aua.am ; koko_kelenjian@edu.aua.am

Dear Dr. Khachadourian and Mr. Kelenjian,

The above referenced protocol was reviewed and approved by the Vice Chair of the Institutional Review Board #1 of the American University of Armenia using the expedited procedure set forth in 45 CFR 46.110, category 6,7, on April 16, 2021. This study will be due for continuing review on or before April 16, 2022. Annual continuing reviews will be required for this proposal. The proposed study can proceed as it is approved by the AUA IRB. However, please note, the IRB must be kept apprised of any and all changes in the research that may have an impact on the level and type of IRB review needed for a specific proposal. You are required to notify the AUA IRB if any changes are proposed in the study that might alter its IRB status and consent procedures. New procedures that may have an impact on the risk-to-benefit ratio cannot be initiated until IRB approval has been given. Please retain this letter as documentation of the IRB's determination regarding your proposal. Please contact me, at akopyank@aua.am with a copy to auairb@aua.am, should you have any questions about the information in this letter. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kristina Akopyan'.

Kristina Akopyan, MD, MPH
Vice Chair, AUA IRB #1

Appendix 6: Journal Form

Interviewer's name (ID) _____

ID #	Patient name (first, last)	Patient's phone	Interview	Date of final result	Attempt 1	Attempt 2	Attempt 3
			First				
			Second				
			First				
			Second				
			First				
			Second				
			First				
			Second				
			First				
			Second				
			First				
			Second				
			First				
			Second				

RESULT CODES (RC)

- | | |
|---|-------------------------|
| 1. Completed interview | 6. Postponed interview |
| 2. No such case (wrong name, wrong address) | 7. Incomplete interview |
| 3. No response (nobody answers the call) | 8. Died |
| 4. Refusal | 9. Other _____ |
| 5. Respondent doesn't understand Armenian | |