

## **Appendix1.Educational Program for paper**

**Health Literacy Promotion Program Title:** Self-care behaviors and quality of life promotion in patients with type 2 diabetes **Target group:** Rural patients with type 2 diabetes covered by Chaldoran Healthcare Centers **Main Idea:** Promoting self-care behaviors and improving quality of Life through promoting diabetes knowledge and health literacy program **Goal:** To promote self-care behaviors and quality of life in rural patients with type 2 diabetes covered by Chaldoran Healthcare Centers

### **Program Objectives:**

- Six months after the three-month health literacy promotion interventional program, there will be a 24% improvement in self-care behaviors of the patients with type 2 diabetes in Chaldoran County
- Six months after the three-month health literacy promotion interventional program, there will be a 30% improvement in the quality of life of the patients with type 2 diabetes in Chaldoran County

### **Behavioral Objectives:**

After the three-month health literacy promotion program to promote self-care behaviors and quality of life, the rate of following self-reported behaviors by patients at Chaldoran County will increase as follows:

- The rate of self-reported daily physical activity recommended by the physician will increase from 33% to at least 57%.
- The rate of FBS/HbA1C test adoption recommended by the physician will increase from 30% to at least 54%.
- The rate of self-reported daily medication prescribed by a physician will increase from 25% (for insulin recipients) and 71% (for oral medication recipients) to at least 49% and 95%, respectively.

### **Learning objectives:**

**Knowledge of disease:**After participating in the educational program, the patients will be able to:

1. List at least three early and late complications of diabetes.
2. Define the reason for the rise and fall in blood sugar.
3. Demonstrate a positive attitude towards careful control of blood sugar.
4. List at least three benefits of exercise in controlling diabetes.
5. Define the effects of either consuming or restricting certain foods (such as dates, raisins, grapes, wholegrain bread, cereals, vegetables, eggs, and fat) on diabetes.
6. List at least three activities to prevent foot complications in diabetes.
7. Define what to do to prevent vision complications resulted from diabetes.
8. Define what will be the level of blood sugar if diabetes is not treated.

### **Health literacy (reading, comprehension, and decision-making skills)**

After performing the educational intervention, at least 80% of diabetic patients participating in the study will achieve the following:

### **Reading skills**

After viewing the self-care posters and pamphlets, the patients will be able to:

1. Interpret the visual instructions on self-care behaviors as presented in the posters/pamphlets.
2. Re-read the visual instructions on the beneficial and harmful foods for diabetic patients as presented in the posters/pamphlets.

### **Understanding Skills**

After receiving instructions on self-care behaviors at the educational sessions, the patients will be able to:

1. Teach-back (comprehension) the instructors on the useful and harmful foods for diabetic patients as presented in the posters/pamphlets.
2. Teach-back (comprehension) the instructors on healthy eating behaviors and doctor's advice about eating regimens.
3. Demonstrate how to take their daily medications regularly, as per the instructions (Teach back).
4. Demonstrate how to ask the physician/pharmacist in drugstores about their questions on the medications (Teach back).
5. Demonstrate how to ask the laboratory receptionist for more information about the contents of their laboratory test sheets (Teach back).

After viewing the "How to go for our local healthcare center/laboratory" video, the patients will be able to:

- Describe the stages of going to their local laboratory for performing a blood sugar test (Teach back).
- Describe the symbols and signals on the stands, walls, and doors of their local healthcare center, clinic, and laboratory (Teach back).

### **Decision-making skills**

After receiving instructions on how to decide the issues related to their diabetes in the educational sessions, the patients will be able to:

1. Demonstrate how to decide on taking their pills/tablets regularly, as per the medication instructions.

2. Will believe that discontinuing or increasing the dosage of medicines prescribed by the physician without his/her permission will aggravate their disease and may endanger their health status.
3. Decide on going to visit a doctor for an examination, in the case of having a first-degree relative with hypertension.
4. Decide on how to avoid the behaviors that cause weight gain and/or high blood pressure.
5. Decide on when and how to visit a doctor for an annual checkup.
6. Decide on how to ask their physician/healthcare professionals about the questions they have about their health.
7. Decide on where, when, and how to find and choose low-fat dairy.

#### Educational strategies

**Strategies to increase knowledge:** teaching strategy, group therapy, face-to-face teaching with teach-back technique (using posters, photos, and instructional videos), and reminiscence.

**Strategies to promote health literacy:** empowerment (increasing knowledge on the disease and how to control it, enhancing reading skills, understanding and decision making about the disease and how to control it with self-help and teach-back techniques)

**Strategies to promote self-care behaviors:** behavior shaping, repetition, and teach-back, and self-monitoring in Self-Help groups.

**Place** Since rural health workers will also be involved in the implementation of the training program, the health homes at the villages are considered as the best place for training sessions.

#### Training activities and schedule of training sessions

The number of patient in the intervention group was 80 .Patients will be divided into 4 groups of 20 participants. For each group, the instructional program will be held in 5 sessions. In each session, 20 participants will be grouped into four 5-person self-help groups (one of the young patients with higher literacy will play the role of a leader), and after each section of the training, the members of each group should review the training subjects with the help of group leader in 5 minutes. Then, the random representative of each group should teach-back the team of trainers a one-minute report of what they learned. At the end of the first, second, and fifth sessions, at least two patients will be asked to provide a reminiscence of their real-life regarding the subjects presented in the session.

#### Appendix 1; Key characteristics of the developed health literacy promotion program

Title of sessions	Contents	Educational Domain	Educational Strategy	Time/team of educators
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Acquaintance with the program/Rising knowledge on the disease (40 min.)	Acquaintance with the program	Cognitive	Lecture	5 min./health educationist (the first author)
	Type-2 Diabetes and the role of blood sugar control	Cognitive	Lecture (5 min.), self-help group discussion (2 min.), feedback (2 min.)	9 min./General physician of the health center
	Reasons for increasing/decreasing blood sugar	Cognitive	Lecture (5 min.), self-help group discussion (2 min.), feedback (2 min.)	9 min./healthcare provider at the health center
	Signs/symptoms of low/high blood sugar	Cognitive	Lecture (2 min.), self-help group discussion (2 min.), story-telling (5 min.)	9 min./General physician of the health center
	Conclusion	Cognitive	Teach-back (8 min.)	8 min./both the general physician of the health center and the health educationist
Rising knowledge on the disease self-care and healthy lifestyle (45 min.)	A brief review of the contents presented in the previous session	Cognitive	Lecture, questioning, and feedback (5 min.)	5 min./health educationist (the first author)
	Healthy eating behaviors in Type-2 Diabetes/Useful/harmful foods	Cognitive/Attitudinal	Lecture (4 min.), self-help group discussion (2 min.), feedback (2 min.)	8 min./ nutrition care provider and the health educationist
	The role of regular medication taking and physical activity in the disease management	Cognitive/Attitudinal	Lecture (5 min.), self-help group discussion (2 min.), feedback (2 min.)	9 min./general physician and health educationist
	Disease complications	Cognitive/Attitudinal	Lecture (5 min.), self-help group discussion (2 min.), feedback (2 min.)	9 min./General physician of the health center and health care provider
	How to prevent disease complications in foot and eyes	Cognitive/Attitudinal	Lecture (3 min.), self-help group discussion (3 min.), story-telling (3 min.)	9 min./healthcare provider and the health educationist
	Conclusion	Cognitive/Attitudinal	Teach-back (5 min.)	5 min./ the health educationist
Health literacy promotion (Reading skills and comprehension) (46 min.)	A brief review of the contents presented in the previous session	Cognitive	Lecture, questioning, and feedback (4 min.)	4 min./health educationist (the first author)
	Reading and interpreting a series of posters related to main self-care behaviors of Type-2 Diabetes	Cognitive/Attitudinal/Skill reinforcement	Lecture (1 min.), self-help group discussion (4 min.), feedback (3 min.)	8 min./ nutrition care provider, healthcare provider, and the health educationist
	Reading and describing the symbols, signs, and contents written on the signposts in hospitals and health centers	Cognitive/Attitudinal/Skill reinforcement	Lecture (1 min.), self-help group discussion (4 min.), feedback (3 min.)	8 min./ healthcare provider and the health educationist
	Descriptions on the possible recommendations of a doctor/the signs written on the medications by pharmacy	Cognitive/Attitudinal/Skill reinforcement	Lecture (3 min.), self-help group discussion (4 min.), feedback (2 min.)	9 min./General physician of the health center and health care provider
	Descriptions on the possible recommendations before having a sugar test	Cognitive/Attitudinal/Skill reinforcement	Lecture (3 min.), self-help group discussion (4 min.), feedback (2 min.)	9 min./healthcare provider and the health educationist
	A review of the content	Cognitive/Attitudinal/Skill reinforcement	Teach-back (4 min.), story-telling (4 min.)	8 min./ the health educationist
Health literacy promotion (Decision-making) (45 min.)	A brief review of the contents presented in the previous session	Cognitive	Lecture, questioning, and feedback (3 min.)	3 min./health educationist (the first author)
	Acquaintance with the health centers and hospitals that the patients can refer when needed	Cognitive/Attitudinal/Skill reinforcement	Lecture (1 min.), self-help group discussion (4 min.), feedback (3 min.)	8 min./ healthcare provider and the health educationist
	When a patient can change the way of taking medications/the role of regular medication taking	Cognitive/Attitudinal/Skill reinforcement	Lecture (1 min.), self-help group discussion (4 min.), feedback (3 min.)	8 min./ General physician, healthcare provider, and the health educationist
	The criteria that one may pay attention to while buying dairy and foods (e.g. value of nutrients, fat, salt, and sugar)	Cognitive/Attitudinal/Skill reinforcement	Lecture (3 min.), self-help group discussion (4 min.), feedback (2 min.)	9 min./General physician of the health center and health care provider
	The reasons for having regular checkups/how to decide when coming across to the behaviors that increase blood pressure	Cognitive/Attitudinal/Skill reinforcement	Lecture (3 min.), self-help group discussion (4 min.), feedback (2 min.)	9 min./ nutrition care provider, healthcare provider, and the health educationist
	A review of the content	Cognitive/Attitudinal/Skill reinforcement	Teach-back (4 min.), story-telling (4 min.)	8 min./ the health educationist

The self-help group discussion strategy in the present study is a group training program designed as a framework to provide a health literacy promotion program that allows the patients to share experiences with others during the training sessions. In each group, one of the diabetic patients with a better level of general literacy and communication skills, as a volunteer, is selected to manage the group and make the ambiguities of the group members clear, under the close supervision of the team of educators. The self-help groups are developed to help the group members in:

- Sharing their experiences and learn, in a practical manner, what to do when they had symptoms of increase or decrease in blood sugar.
- Work together to plan for group daily walking
- Enabling to limit the daily consumption of high-fat foods and sugar, and how to find alternatives to them. For example, drink tea with some raisins or date instead of sugar.
- Enabling to including at least three cups of vegetables/fruits in their daily diet.
- Enabling on how to take diabetes pills and inject insulin on time as directed by their doctor.
- Enabling on how to adhere to the recommended intervals for taking the medications.
- Recognizing the nutritional value of foods and be able to purchase dairy products based on their fat percentage.

**Procedure** The diabetic patients in the intervention group will be invited to attend the program by the rural health worker for a one-hour session, for each session, at the health facility, and in the session, the program will be run based on the program characteristics.

**Educational Materials** 1. A poster on early diagnosis and treatment of diabetes. The poster illustrates the role of measuring blood glucose levels on disease control and management, as well as the times and locations to get the test, and highlights the consequences and risks of not performing the test. 2. Diabetes self-care poster. The poster shows recommendations for adhering to a simple routine physical activity plan, maintaining a good weight, consuming fruits and vegetables, and not smoking and high-fat foods, and emphasizes regular medication taking and sugar testing .3. A Poster to select the right beverages

The poster illustrates in a simple sentence that, in the case of being thirsty, water is the best option for a diabetic patient and emphasizes that other beverages, including soda, are harmful to diabetics because of their high sugar content .4. A pamphlet on how to conduct a blood glucose testing. The

most pictorial pamphlet represents to a diabetic patient that when to go for blood glucose testing, and specifies the place where the patient should go for the test. It also illustrates that the patient should have fasted for testing. In the last two pages, it illustrates the steps of measuring blood sugar at home .5. A pamphlet on physical activity This material contains images of exercise and physical activity suitable for older adults with simple and clear sentences that complement the pictures. In the first pages, consultation with a physician before performing any exercise program is emphasized. Then, it shows the criteria to select appropriate clothing and shoes, and finally illustrates the appropriate distance between eating and exercise. In this final section, the correct condition and the duration of exercise are also represented .6. A pamphlet on medication adherence The most pictorial pamphlet illustrates how to take the medications correctly, and emphasizes that the patient should not spontaneously reduce, increase, or discontinue the recommended dose of medications, given the good or bad health condition. Moreover, how to take the medication, according to the physician's instructions, is illustrated .7. A video on how to go for a sugar test. This video features pictures of patient referrals for blood glucose testing from the moment he enters the health center to the moment arrives at the diabetes ward, which is also spoken along with images of all stages. In this video, we intended to assist diabetic patients in referring to the health center for sugar testing with or without a referral sheet. So, the patient will be thoroughly familiar with the process and procedures of performing the test.