

## The Effect of Training Diabetes Prevention Behaviors on Promotion of Knowledge, Attitude and Practice of Students for Prevention of Diabetes in Mashhad City

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### **Abstract**

#### **Introduction**

Diabetes is a complex metabolic disease that not only inheritance, but also lifestyle and knowledge of individuals about the disease have an important role in the prevalence of it. The current study aims to determine the effect of training on diabetes prevention behaviors among students in Mashhad.

#### **Materials and Methods**

In this semi-empirical study, 102 students (51 for case group and 51 for control group) were examined by multistage random sampling. Educational content included 4 sessions, and each lasted for 2 hours, and using methods such as lectures, question and answer, slide show about the diabetes disease, its complications and prevention methods. Then questionnaires were completed by students in three stages (before the intervention, immediately after intervention and two months after the intervention). Data analysis was performed by SPSS-16 software and independent T, repeated measurement and descriptive tests.

#### **Results**

The results of this study showed that before the training, there were no significant differences between case and control groups in terms of the mean knowledge, attitude and practice score ( $P > 0.05$ ); but after the training a significant increase was observed in the case group ( $P < 0.001$ ).

#### **Conclusion**

Education has an essential impact on promotion of students' knowledge and attitudes about diabetes prevention. Due to the high prevalence diabetes among people and irreparable complications of the disease in old ages, training in adolescence, in order to enhance their knowledge in prevention of the diabetes can be considered as an effective step.

**Key Words:** Diabetes, Prevention, Students, Training.

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## Introduction

In recent decades, synchronously with economic developments epidemiology of diseases have also undergone changes such as decrease in infectious diseases and increase in disease related to lifestyle (1). Diabetes mellitus is the most common endocrine disease and at the present time, there are about 150 million people with diabetes worldwide and it is estimated to reach 300 million people by 2045.

In Iran 1 out of every 5 people over 30 years old is with diabetes or glucose intolerance. This disease by creating metabolic abnormalities causes chronic complications in eyes, kidneys, nerves and blood vessels.

About 60-70 percent of patients have one or more complications during the disease (2). The diabetes disease is called the hidden epidemic and is considered as a common public health problem in the United States and other parts of the world and even in Iran. Because diabetes causes direct costs about 2.5 to 15% of total health budget and multiples the indirect costs and causes some complications such as cardiac ischemia, hypertension, neuropathy, cataract, etc.; and is responsible for 90% of total mortality in the world (3).

Results of another study carried out by Disease Management Center of Ministry of Health and Medical Education on over 800 thousand urban - rural population in 2008 showed that about 3 to 5.2 million people are with diabetes in the country (4). Enhancing the knowledge, attitude and practice of diabetic patients about the diabetes is effective in controlling the disease and reducing its complications. Training and learning causes a stable change in attitude and practice of people and finally will change their lifestyle (5).

School ages are one of important periods of life for providing the health for the future life. Performing suitable physical activity and healthy nutrition during the growth years helps much in fixation of health. Thus, there is a great potential for increasing the health in this age group (6). In adolescence period, teenagers develop their fields of ability and gradually the responsibility for health is transferred from their parents to teenagers. Also this huge part of society is the productive force and capital of each country (7). Due to the high prevalence of diabetes among people and irreparable effects of the disease in old ages, training in adolescence in order to enhance their knowledge, attitude and practice in prevention of diabetes can be considered as an effective step. For this purpose, this study is carried out to examine the effect of health training intervention on promotion of knowledge of students and changing attitudes towards the desired attitude and finally their behavioral changes.

## Materials and Methods

The present study is a semi - empirical pre-intervention and post-intervention with test and control groups, that was carried out in order to examine the effect of training on diabetes prevention behaviors of students in Mashhad, North-east of Iran in December 2014 to March 2015.

The population in this study were male elementary school students of Mashhad, who were studying between 2014-2015. The sampling was random that among elementary schools of one area of total 8 areas in Mashhad, 102 students in fifth and sixth grades from two elementary schools for boys (n=51) from one school were considered as test group and (n=51) in fifth

and sixth grades from the other school were considered as the control group.

The students who were not completed the questionnaire to the end or were absent were excluded from the research. Both groups were evaluated before the training intervention, immediately after training sessions and also two months later. It is noteworthy that the students were justified about tests of the research and how the study will be carried out and about confidentiality of the information and also the purpose of the research and they were enrolled in the study by their personal desire.

Data collection tool for this study was a researcher - designed questionnaire. For validity and reliability of the questionnaire respectively, content validity and Cronbach's alpha test methods were used. For determining the validity of the questionnaire, it was sent to 5 Associate professor of health education and necessary reforms in the questionnaire were applied based on their opinions.

Total reliability of the questionnaire was calculated  $\alpha = 0.76$  according to the results of Cronbach's alpha test. The used questionnaire in this study was consisted of 4 parts: **A-** Demographic and background questions (included 4 questions and was evaluated the information about the student's age, educational level of parents and family income). **B-** Knowledge questions (included 10 questions about their knowledge about diagnosis symptoms of Type 1 and 2 diabetes, Type 2 diabetes prevention methods and symptoms of hypoglycemia and hyperglycemia). **C-** Attitude questions (included 8 questions about the awareness of the individuals about using sugary and fried foods, visiting a doctor for treatment and

treatment costs and believing in chance in getting a disease). **D-** Practice questions (included 10 questions about the use of sports facilities and using fruits and vegetables).

In the knowledge part of the questionnaire, scores of the students was calculated out of 10 and for each correct answer 1 and for each wrong answer 0 points were considered. The attitude questions included 8 questions and were designed based on three – point Likert Scale that the range of points for each question was 1 to 3; so that the highest point was considered for “I agree” attitude and the lowest point was considered for “I disagree” attitude. In this part the scores of students was calculated out of 24.

In practice part, the scores of students were calculated out of 50; so that for each correct diabetes prevention behavior 5 points and for each wrong behavior 0 points were considered. The training for the test group was performed in 4 sessions, each lasted for two hours (one session per week) and for effective and more reliable training a combination of training methods such as lectures, question and answer, brainstorming and group discussion were used. Another questionnaire was completed again for both of the groups immediately after training and also 2 months after training (for continuity of the behaviors and durability of the trainings) and pre-training and post-training data were compared.

Finally, the obtained data from these three stages were compared and the collected data were analyzed by using statistical software SPSS-16, repeated measurement test (comparison of the means), independent t-test and the descriptive tests and  $P < 0.05$  was considered statistically significant.

## Results

In this study, 102 male students (in fifth and sixth grades of elementary school) of 2 different elementary schools were considered as case and control groups. Age

range of participants was 10 to 13 years and mean of  $11.48 \pm 0.72$  years. The case and control groups were similar in terms of demographic variables and no significant differences were observed among them ( $P > 0.05$ ) (Table.1).

**Table 1:** Frequency distribution of education level of fathers, mothers and family income in the case and control groups

Variables		Case	Control
		n (%)	n (%)
Mother's education	Illiterate	2 (3.9)	4 (7.8)
	Primary	14 (27.5)	8 (15.7)
	Guidance school	8 (15.7)	14 (27.5)
	Diploma	18 (35.3)	18 (35.3)
	Higher diploma	9 (17.6)	7 (13.7)
	Total	51(100.0)	51 (100.0)
Father's education	Illiterate	3 (5.9)	2 (3.9)
	Primary	7 (13.7)	11 (21.6)
	Guidance school	12 (23.5)	14 (27.5)
	Diploma	15 (29.4)	14 (27.5)
	Higher diploma	14 (27.5)	10 (19.6)
	Total	51 (100.0)	51 (100.0)
Family income	<5,000,000 Rials	18 (35.3)	7 (13.7)
	5,000,000-10,000,000 Rials	21 (41.2)	35 (68.6)
	>10,000,000 Rials	12 (23.5)	9 (17.6)
	Total	51 (100.0)	51 (100.0)

The results of this study showed that there is a significant difference in knowledge, attitude and practice scores of case group between pre-intervention and post-intervention stages ( $P < 0.001$ ); but in the control group there is no significant difference in knowledge ( $P = 0.186$ ), attitude ( $P = 0.170$ ) and practice ( $P = 0.839$ )

scores between pre-intervention and post-intervention. Also there was no significant difference between the mean knowledge ( $P = 0.127$ ), attitude ( $P = 0.753$ ) and practice ( $P = 0.152$ ) scores of both test and control groups in pre-intervention stage but a significant difference was observed in post-intervention stage ( $P < 0.001$ ). It

should be mentioned that only in the mean attitude scores no significant difference was observed immediately after training

between the two cases and control groups (Table2).

**Table 2:** Comparison of knowledge, attitude and practice in three before, immediately and 2 months after the intervention stages in case and control groups

Variables	Time of Study	Case	Control	P-value
		Mean $\pm$ SD	Mean $\pm$ SD	
Knowledge	Before the intervention	5.14 $\pm$ 1.7	4.63 $\pm$ 1.60	P= 0.127
	Immediately after the intervention	9.24 $\pm$ 1.06	5.02 $\pm$ 1.60	P<0.001
	2 months after the intervention.	8.82 $\pm$ 1.12	5.02 $\pm$ 1.60	P<0.001
	P-value	P<0.001	P=0.186	
Attitude	Before the intervention	14.67 $\pm$ 2.33	14.51 $\pm$ 2.67	P=0.753
	Immediately after the intervention	14.22 $\pm$ 2.23	14.82 $\pm$ 2.20	P=0.170
	2 months after the intervention.	19.58 $\pm$ 1.75	15.72 $\pm$ 2.88	P<0.001
	P-value	P<0.001	P=0.170	
Practice	Before the intervention	24.98 $\pm$ 8.60	22.51 $\pm$ 8.68	P=0.152
	Immediately after the intervention	43.74 $\pm$ 10.04	23.27 $\pm$ 8.48	P<0.001
	2 months after the intervention.	30.62 $\pm$ 8.85	22.84 $\pm$ 8.24	P<0.001
	P-value	P<0.001	P=0.839	

## Discussion

The main purpose of this study was improvement of the practice of students through enhancing the knowledge in order to change their attitudes by first level prevention, training of correct behaviors (training the benefits of physical activity and healthy nutrition), about diabetes

prevention through an intervention training program. Poor lifestyle habits of children and adolescents especially inactivity and unhealthy nutrition not only considered as a threat to the health of this vulnerable group, but also puts the country in epidemic risk of non-contagious diseases such as cardiovascular diseases, diabetes,

osteoporosis, mental disorders and even some malignancies (8). Schools by providing required guidance could be an ideal opportunity to do these activities in this age group. In addition, children in schools also enjoy their teachers, parents and friends' supports for doing these activities so this is a very important point (9).

The results of this study showed that there was a significant increase in mean knowledge, attitude and practice scores of the trained group after the intervention; that this shows the positive effect of training intervention on enhancing the knowledge, attitude and practice, which is similar to the results of a Rezaei et al., study in Aligudarz, Lorestan that showed trained people have better knowledge, attitude and practice about the diabetes disease (10). Also it is aligned with a Estebarsari study in 2008 about training intervention on physical activity (11). Also based on the results of another research which was carried out by Baranowski with purpose of increasing the use of fruits and vegetables and changing the physical activity pattern in Greece on students of fourth and fifth grades of elementary school showed that the obtained results from practice and knowledge after holding the training sessions are significantly increased (12).

The O'Brien study about the nutritional knowledge of the students in 2006 showed that most of the participants had low nutritional knowledge (13), which is aligned with results of our study in pre-intervention stage (in the current study, the mean knowledge score in pre-intervention stage was 5.14 out of 10). Also a Bordbar study about comparison of food habits and the knowledge of students about nutrition which showed that the training has much effect on this issue and statistical tests showed significant relationship in effect of training on nutritional knowledge is aligned with the result of mean knowledge

score of our study in test group in post-intervention stage (14).

In this study, the mean practice scores in pre-intervention stage were 24.98 out of 50. This means that almost 50% of students had improper or unsanitary practice, and that is coordinated with a Gregori et al. study, that carried out in Greece in 2008 on 2,435 students; because the results of the mentioned study showed that 50.4 % out of all the students had unbalanced nutrition (15). Emadzadeh et al. showed that especial training have had an impact on learning of students (16).

### **Conclusion**

"Education and Training" and "Health and Medical Education" organizations as two effective institutions can provide the necessary basis for enhancing the knowledge and improve the practice of students about prevention behaviors about different diseases. Thus, the following proceedings are recommended to achieve these goals:

- Inclusion of educational materials about prevention of diabetes in textbooks;
- Enriching the school libraries with books about health issues;
- Inviting mothers to training sessions; because they are one of best resources for transferring and representing the educational materials;
- Doing morning exercise in schools;
- Using fruits and a snacks with high nutritional value for students, according to the school's health educator;
- Holding story writing and painting competitions with titles like advantages of exercising, disadvantages of inactivity, advantages of healthy nutrition and disadvantages of obesity.

**Conflicts of interest:** None.

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