International Journal of Advanced Nursing Studies, 6 (1) (2017) 36-44

International Journal of Advanced Nursing Studies

Website: www.sciencepubco.com/index.php/IJANS
doi: 10.14419/ijans.v6i1.7178
Research paper

Effect of educational program on improving knowledge and practice for adolescences with type 1 diabetes

Nagat F. Abolwafa [1]*, Sanaa M. Ahmed [1], Sahar A. Aly [2]

[1] Pediatric Nursing, Faculty of Nursing, Minia University
[2] Maternal and Child Health Nursing, Faculty of Nursing, Minia University
**Corresponding author E-mail: medonoga13@yahoo.com*

Abstract

Background: Diabetes mellitus (DM) is one of the most common endocrine and metabolic conditions in childhood.
Objectives: to determine the effect of educational program on the adolescences children knowledge and reported practices with type 1 diabetes.
Method: Design pretest -posttest design was utilized to conduct this study.
Setting: study was conducted at outpatient clinic for diabetes at Minia University Hospital for Obstetrics and Pediatrics.
Sample: 50 adolescences children with type 1 diabetes.
Tools: Pre-designed questionnaire sheet and Educational and training program.
Results: this study showed significant improvement in adolescences knowledge and reported practices in post/test I and II.
Conclusion: after the implementation of the program, there was remarkable improvement of adolescences children knowledge and reported practices.
Recommendations: a developed program should be applied and repeat again every 6 months in the same study setting and adopted in other similar settings with required modifications, provision of continuing education programs.

Keywords: *Adolescences; Educational Program; Type 1 Diabetes.*

1. Introduction

Diabetes mellitus (DM) is a type of metabolic diseases characterized by chronic hyperglycemia resulting from deficiency in insulin secretion, insulin action, or both the two major types of diabetes, type 1 diabetes mellitus (T1DM) where there is autoimmune destruction of the pancreas that makes it incapable of secretion of insulin. In type, 2 diabetes mellitus (T2DM), patients can still secret insulin, but either insufficient amount to meet the needs of patients, or their body has become resistant to its effects with a compensatory increase in insulin secretion and release that can also end in beta cell damage (Craig et al., 2009).
According to (WHO, 2012), diabetes mellitus (DM) is characterized by hyperglycemia and disturbance of carbohydrate, fat, protein metabolism that was associated with the independent or relative insufficiency of insulin action or production.
Type 1 diabetes mellitus (T1DM) found in children and adolescence, known as juvenile onset diabetes; furthermore, T1DM has been associated with lifelong insulin dependency for survival hence known as insulin dependency diabetes mellitus. In addition, diabetes type 1 is chronic disease in which the pancreas secret little or no insulin; a hormone needed to allow sugar (glucose) to enter cells to produce energy; the signs and symptoms quickly come and may include: thirst increased and urination frequent, extreme hunger, weight loss, fatigue and blurred vision (Center for Disease Control and Prevention, 2011).
Type 1 diabetes mellitus (T1DM) recently in Egypt can be using a common protocol and WHO criteria for classification and diagnosis. Prevalence average of the country into a whole for people higher level in the age of 10 years old was 4.3%, the geographical difference was distinct: 4.1% in rural agricultural areas, 1.5% in rural desert areas, and 5.7% in urban areas, in several selected villages, diabetes mellitus was nearly completely absent. Study among younger ages indicates prevalence of 0.01%, 0.06% and 0.14% among children at preparatory, primary and secondary school respectively. Children who a high risk of diabetes mellitus is always associated with family history of the disease, premature atherosclerosis, obesity and hypertension (El-Ziny et al., 2014).
Diabetes mellitus type 1 incidence and prevalence showed advanced increase over a period of 18 years among children aged from zero to 18 years-old living outside the Nile Delta region. The higher prevalence of type 1 diabetes mellitus occurrence is observed in rural areas, and female predominance was evident (El-Ziny et al., 2014).
(Seaquist et al., 2013) mentioned that the following standard for anticipation of hypoglycemia maintains ideal glycemic control. These standards include: 1) self- monitoring of blood glucose or continuous glucose sensing, 2) diabetes self-management (supported by education and empowerment), 3) individualized glycemic objective, 4) flexible and appropriate insulin or other drug regimens; 5) consideration of known risk factors of hypoglycemia, and 6) professional support and guidance.
Diabetes mellitus type 1 individualized treatment determined by a close working relationship between the patients and diabetes care team. The health care professionals could improve patient knowledge and make positive changes in life style and self-care decisions. The diabetes care team involvement not only produce the initial patient's guidance, but also adjust the short and long-

term complications for early find out and management of complication (George, 2012).

- Nurses have main roles and responsibilities to improve knowledge of adolescences about diabetes mellitus type 1. The adolescences have to be taught how to insulin self-injection, wash his feet daily, dry feet carefully, especially between the toes, and inspect feet for corns, calluses, redness, swell, blisters, and cuts through the skin. The adolescences could be encouraged to report any changes to his/her health care provider as soon as possible (Perrin et al,. 2009).

Adolescences should be increased physical activities, appropriate diet proper pharmacological interventions, and weight reduction may decrease the incidence and threat of diabetes complications significantly, even amongst high-risk age. Thus, increasing awareness of adolescences related modifiable risk factors, health education and developing strategies to identify and manage high-risk age, were few of various possible ways, that may abolish this emerging problem of diabetes mellitus type 1 (WHO, 2008). Various studies have been made in many parts of the world showed that there is decrease of awareness and knowledge of various risk factors related with diabetes among people (Hakeem, 2010).

2. The aim study

To identify the effect of educational program on the adolescences knowledge and practices about type1 diabetes

3. Subjects and method

3.1. Research design

Pretest-posttest research design was utilized to meet the aim of this study.

3.2 Setting

This study was conducted in outpatient clinic for diabetes at Minia University Hospital for Obstetrics and Pediatrics.

3.3. Sampling

50 adolescences with diabetes type 1 at Minia University Hospital for Obstetrics and Pediatrics in a period of nine months were included in this study.

3.4. Tools for data collection

two tools were used in this study and developed by the researcher to collect the necessary data for this study.

Tool I: Pre-designed questionnaire sheet for adolescences as pre/post and follow-up tests, that was designed by the researcher after reviewing of the related literature .To assess the adolescence knowledge and reported practices toward diabetes type 1.

It included the following parts:

Part I: Personal data: as adolescence sex, age, address, attended previous training course about diabetes type 1.

Part II: Adolescences knowledge and reported practices toward diabetes type 1. Two types of questions were used in this format; the open ended and multiple– choice question. Adolescences knowledge about diabetes type 1 has 34 items include the following: 3 items about the meaning of diabetes type 1, 3 items about diabetes type 1 diet, 4 items about treatment, 7 items about diabetic complication, and 17 items about adolescences reported practices of diabetes type 1.

Scoring system:

Scoring system for data collection from knowledge questionnaire sheet: a score of one was given for correct answer and a zero for incorrect answer. For each part, the scores of the items were summed up and the total divided by number of the items, giving a mean score for the part. These scores were converted to a percent score and mean, and standard deviations were computed. The adolescences children knowledge was considered satisfactory if the percent score is 60% or more and unsatisfactory if less than 60%.

The percent improvement or change in knowledge between phases of the program was calculated by the following equation:

$$\text{Pre-post \% change} = \frac{\text{Post score} - \text{pre score}}{\text{Pre score}} \times 100$$

A positive percent change means improvement; while a negative percent change means decrease of the level.

Tool II: Educational program:

The researcher prepared educational and training booklet after assessment of knowledge and reported practices to identify of needs of adolescences with diabetes type 1 in a form of printed (Arabic booklet). Information based on review of relevant literature (nursing textbook, journals and internet resources) about diabetes type 1, and then the educational program was reviewed by a panel of medical and nursing experts before its implementation.

3.5. Validity and reliability

The tool was tested the content validity by a jury of three experts in the field of the study to test the content validity of tool and necessary modifications were done. Reliability of the tool was performed to confirm its consistency using Cronbach's alpha coefficient method.

3.6. Pilot study

A pilot study on (10 %) 5 adolescence was conducted at Minia University Hospital for Obstetrics and Pediatrics. A pilot study was conducted to test clarity & completeness of the study tools and to determine the time required to fill each tool. According to the results of pilot, the needed modification, omissions and/or additions were done. A jury acceptance of the final forms was secured before actual study work and the reliability was assessed in a pilot study by measuring their internal consistency using Cronbach's alpha coefficient method.

3.7. Ethical consideration

- The oral consent was obtained from all adolescences to participate in the study and the nature and purpose of the study were explained to them.
- The researchers initially introduced themselves to all optional subjects and they were assured that the collected data would be absolutely confidential.
- They were informed that participation is voluntary and that they could withdraw at any time of the study.
- Confidentiality of the adolescence data was ascertained. Confidentiality and anonymity were assured.

3.8. Field work

The field work was carried out through a period of 12 months starting from October 2015 to Julie 2016; the time required for the program implementation was 12 months. One month for pre-test, 6 months for implementation of the program, one month for post-test I and after 3 months collected the post-test II in one month. With approximately 180 hours divided in 60 hours theoretical and 120 hours practical, adolescences children was divided into 10 small groups each group has 5 adolescences. There was total 10 sessions for each group; each session was variable and ranged between 60 and 90 minutes. Each participant gets a copy of the program booklet that included all the training materials. Each

session usually started by a summary of what has been taught during the preceding sessions and the objectives of the new one. Giving praise and/or recognition to the interested adolescences were used for motivation during program implementation.

The actual work started by meeting the adolescences throughout the follow up in outpatient clinic for diabetic, the researcher first introduced herself to them and gave them a complete back ground about the study, it's aim, then the pre-test format, was distributed in order to collect the required data. The researcher was available for more clarification whenever needed. Then, the content of the program was designed based on actual educational need assessment of the studied adolescences. Consequently, the subject content has been sequenced through theoretical and practical sessions that contained a practical performance to the targeted intervention, from the researcher, are demonstration from the researcher, and are redemonstration from the studied sample. The session 1, content: personal interviewing of the studied adolescences, the aim, duration of the study explained by the researcher through direct personal communication and discussion. The session 2, content: definition of diabetes type 1, causes, sign and symptoms. The session 3, content: diet of diabetic type 1 in adolescences. The session 4, content: blood sugar test. The session 5, content: self-injection of insulin. The session 6, content: exercises. The session 7, content: complication of diabetes type 1. The session 8, content: revision. Methods of teaching were through a modified lecture, demonstration, re-demonstration, and group discussion, and Video. At the last, post-test I format was distributed in order to collect the required data. After three months post-test II was collected from adolescences.

4. Limitations of the study

Difficult collect adolescences children to attend the program, in addition, some of adolescents children has low concentration and need continuous repetition, which required a lot of time and effort.

5. Statistical analysis

Data entry was done using compatible personal computer. The statistically analysis was done using SPSS-20 statistical software package and Excel for figures. The content of each tool was analyzed, categorized and then coded. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Qualitative studied variables were compared using Chi-square test. Pearson correlation analysis was used for assessment of the inter-relationships between the total scores of adolescences children knowledge and practical knowledge about diabetes type 1. Statistical significance was used at P. value <0.05

6. Results

Table (1): This table illustrates that the characteristics of the studied sample. It was found that, the more than one third of studied sample (40%) of them was late adolescences aged 19:21 years old, with a mean age 16.7 ± 3.1 years. As regards sex, more than half of studied sample (60%) was female adolescences. As regards residence of studied sample, it was noticed that more than two third (80%) of adolescences students has diabetes type 1 in rural area. Regarding to the previous attendance of training courses, the about two third of the studied sample (70%) didn't had training courses about type 1diabetes. As regards the adolescences students' level of sugar in blood, it was noticed that, four fifth of them (80%) were high level of sugar in blood.

Table (2): This table revealed that, the relation between the studied sample knowledge pre-test, post-test I and post-test II about diabetes type 1 in adolescences and their characteristics. It indicates an increase in knowledge scores in all knowledge areas at the post-test and post-test II phase. However, this increase reached statistically significant difference between the adolescences age, sex, address, training courses and their knowledge (P. 0.00, 0.04, 0.05 and 0.000); respectively. It was evident that higher percentages of satisfactory knowledge in post-test I were observed among adolescences in the age from 19:21 years old (26%), the female (46 %), in the rural area (66%) and adolescences who didn't' attended previous training courses about diabetes type 1 in post-test I were (60%).

Table (3): The above table illustrates that 42% of adolescences in pre-test didn't know the meaning of DM but 78% of adolescences in post- test I know the meaning of DM. Regarding the predisposing factors, 42 % in pre-test didn't know the predisposing factors of diabetes but 82% know the predisposing factor in immediate post-test. while 18 % didn't know any signs and symptoms of disease in pre-test but 88% know the sign and symptoms of disease in immediate post-test. Compared with posttest 2 it is noticed that 52% of adolescences know the meaning of DM, while 58% know the predisposing factors of diabetes and 70% of adolescences know most signs and symptoms of disease. However, this increase reached statistically significant difference between the adolescences definition of DM, predisposing factors and signs and symptoms of DM (P. 0.05)

Table 1: Distribution of Adolescences Characteristics Have Diabetes Type 1 (N= 50)

Items	No	%
1) Age in years:		
• Early adolescences (11:14 years)	15	30
• Middle adolescences (15:18years)	15	30
• Late adolescences (19:21years)	20	40
Mean ± SD	16.7 ± 3.1	
2) Sex of adolescences:		
• Mal	20	40
• Female	30	60
3) Residence:		
• Rural	40	80
• Urban	10	20
4) Previous attendance of training courses about diabetes type 1:		
• Yes	15	30
• No	35	70
5) Level of sugar in blood of adolescences students have diabetes type 1:		
• High level	40	80
• Irregular	10	20

Table 2: The Relation between the Studied Sample Knowledge Pre-Test, Post-Test I and Post-Test II about Adolescences Have Diabetes Type 1 and Their Characteristics (N= 50)

Items	Pre-test Knowledge				Post-test I knowledge				Post-test I I knowledge				P. value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		
	No	%	No	%	No	%	No	%	No	%	No	%	
1) Age in years:													
• Early adolescence (11:14)	3	6	12	24	10	20	5	10	7	14	8	16	
• Middle adolescence													X^2=0.75
• (15:18)	4	8	11	22	12	24	3	6	6	12	9	18	0.000*
• Late adolescence													
• (19:21)	7	14	13	26	13	26	7	14	6	12	14	28	
2) Sex													X^2=0.72
• Male	5	10	15	30	13	26	7	14	12	24	8	16	0.04*
• Female	5	10	25	50	23	46	7	14	20	40	10	20	
3) Address													
• Rural	8	16	32	64	30	60	10	20	27	54	13	26	X^2=0.55
• Urban	2	4	8	16	7	14	3	6	8	16	2	4	0.05*
4) Training courses													X^2=0.6
• Yes	3	6	12	24	10	20	5	10	10	20	5	10	5
• No	10	20	25	50	30	60	5	10	28	56	7	14	0.00*

*= Significant

Table 3: Distribution of Adolescences According to Their Knowledge about Diabetes Mellitus Type 1 (N= 50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
1) Definition of DM							
• Chronic illness and high blood glucose	20	40	3	6	7	14	
• Sugar in urine and decrease insulin production	6	12	4	8	5	10	X^2=0.70
• Don't know	21	42	4	8	12	24	0.05*
• All of the above	3	6	39	78	26	52	
2) Predisposing factors:							
• Obesity and hereditary	11	22	5	10	5	10	
• Life style and disease in pancreas	16	32	2	4	5	10	X^2=0.40
• Don't know	21	42	2	4	11	22	0.05*
• All of the above	2	4	41	82	29	58	
3) Signs and symptoms of DM:							
• Frequent hungry and Thirst	11	22	2	4	6	12	
• Frequent urination	12	24	2	4	3	6	X^2=0.27
• Weight loss and Fatigue	4	8	0	0	1	2	0.05*
• Don't know	9	18	2	4	5	10	
• All of the above	14	28	44	88	35	70	

*= Significant

Table (4): This table clarifies that, 28% in pre-test of adolescences didn't know the foods that should be avoided. 40% of adolescences didn't know the foods that they are free to eat. Additionally 60% of adolescences didn't know the foods that should be eaten moderately. While immediate posttest shows that 70% of adolescences know all food that should be avoided completely, 52% of adolescences know foods that are eaten freely, but 64% know all foods that are eaten moderately. Compared with posttest II, it is noticed that 58% of adolescences know the foods that should be avoided completely, 36% know the foods that can be eaten freely and 44% know the foods that should be eaten moderately. However, this increase reached statistically significant difference between the adolescences know all food that should be avoided completely, know the foods that they are free to eat and know all foods that are eaten moderately (P. 0.01, 0.03 and 0.02); respectively.

Table (5): This table illustrates that in the pre-test 60% of adolescences know that only insulin is used for treatment for DM. Regarding the sites for insulin injection, it is noticed that 21% of adolescences know that the arm is used for insulin injection. 74% of adolescences didn't know the complication of insulin injection. In addition, 32% didn't know the importance of therapeutic regimen. While in immediate post-test, it was noticed that 88% of adolescences know that only insulin is used for treatment for DM, sites for insulin injection 64% of adolescences know all sits for insulin injection and 70% of adolescences know the complication of insulin injection. 80% of adolescences know the importance of therapeutic regimen. Compared with posttest II it is shown that 86%, 56%, 60% and 58% of adolescences know the drugs used for treatment of DM, sites for insulin injection, complication of insulin injection and the importance of therapeutic regimen respectively. However, this increase reached statistically significant difference between the adolescences know the drugs used for treatment of DM, sites for insulin injection, complication of insulin injection and the importance of therapeutic regimen nutrition and treatment (P. 0.02, 0.01, 0.01 and 0.03); respectively.

Table (6): This table reveals that 46 % of adolescences didn't t know the complications of DM, but 18% of adolescences know the most common complications of DM as low and high blood sugar, retinopathy, neuropathy. However, in immediate post-test it is noticed that 64 % of adolescences know the most common complications of DM. Compared with post-test II, it is noticed that 56 % of adolescences know all items that are related to complications. However, this increase reached statistically significant difference between the adolescences know the most common complications of DM as low and high blood sugar, retinopathy, neuropathy, don't know and all of above (P. 0.01, 0.02, 0.01,0.01,0.02 and 0.03); respectively.

Table 4: Distribution of Adolescences According to Their Knowledge about Nutrition (N =50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
1) Foods that should be avoided completely:							
• Sweets	23	46	6	12	10	20	
• Animal fats and butter	0	0	2	4	2	4	
• Fatty meat	1	2	2	4	2	4	X^2=0.42
• Don't know	14	28	5	10	7	14	0.01*
• All of the above	12	24	35	70	29	58	
2) Foods that should be eat freely:							
• Meat, fish and eggs	4	8	5	10	3	6	
• Vegetable soap	5	10	4	8	4	8	X^2=0.64
• Green leafy vegetables	7	14	2	4	5	10	0.03*
• Fruiting vegetables as onions	6	12	3	6	5	10	
• Don't know	20	40	10	20	15	30	
• All of the above	8	16	26	52	18	36	
3) Foods that should be eat moderately:							
• Corns and rice	7	14	2	4	6	12	
• Oil plants	1	2	0	0	1	2	X^2=0.81
• Fruits	9	18	5	10	5	10	0.02*
• don't know	30	60	11	22	16	32	
• All of the above	3	6	32	64	22	44	

*= Significant

Table 5: Distribution of Adolescences According to Their Knowledge about Treatment (N =50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
1) Drugs used for treatment of DM:							
• Oral medication	6	12	4	8	2	4	X^2=0.77
• Insulin	30	60	44	88	43	86	0.02*
• All of the above	14	28	2	4	5	10	
2) Sits for insulin injection:							
• Abdomen	8	16	9	18	6	12	
• Thigh	2	4	2	4	1	2	X^2=0.75
• Arm	21	42	5	10	9	18	0.01*
• Don't know	12	24	2	4	6	12	
• All of the above	7	14	32	64	28	56	
3) Complication of insulin injections:							
• Hypoglycemia	10	20	5	10	5	10	
• Allergy	0	0	0	0	0	0	X^2=0.68
• Insulin resistance	3	6	5	10	5	10	0.01*
• Don't know	37	74	5	10	10	20	
• All of the above	0	0	35	70	30	60	
4) Commitment to the therapeutic regimen nutrition and treatment:							
• To control the disease	14	28	3	6	9	18	X^2=0.55
• To prevent complications	13	26	4	8	5	10	0.03*
• Don't know	16	32	3	6	7	14	
• All of the above	7	14	40	80	29	58	

*= Significant

Table 6: Distribution of Adolescences According to Their Knowledge about Complications of DM (N =50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
Low blood sugar	4	8	2	4	4	8	X^2=0.45 0.01*
High blood sugar	4	8	2	4	3	6	X^2=0.66 0.02*
Retinopathy	4	8	2	4	2	4	X^2=0.82 0.01*
Neuropathy	6	12	2	4	2	4	X^2=0.60 0.01*
Don't know	23	46	10	20	11	22	X^2=0.70 0.02*
All of the above	9	18	32	64	28	56	X^2=0.88 0.04*

*= Significant

Table (7): This table reveals that 52%, 94 % and 68% respectively of adolescences didn't know the definition, signs and symptoms, and causes of hyperglycemia. While in immediate post-test it is noticed that; 74%, 56% and 52% of adolescences know the definition, signs and symptoms, and causes of hyperglycemia respectively. Compared with post-test II it is shown that 70%, 46%, and 50% of adolescences know the definition, signs and symptoms, and causes of hyperglycemia respectively. However, this increase reached statistically significant difference between the adolescences know definition, signs and symptoms, and causes of hyperglycemia (P. 0.03, 0.01, and 0.01); respectively.

Table (8): This table indicates that 64 %, 40%, and 70% of adolescences didn't know the definition, signs and symptoms and causes of hypoglycemia respectively. While in immediate post-test, 80 %

of adolescences know the definition of hypoglycemia. Regarding the signs and symptoms of hypoglycemia there are 66% of adolescences who know the signs and symptoms but 74% of adolescences know the causes of hypoglycemia. Compared with post-test II 80% of adolescences know the definition of hypoglycemia but 46% know the signs and symptoms, 58% of adolescences know the causes of hypoglycemia. However, this increase reached statistically significant difference between the adolescences know definition, signs and symptoms, and causes of hypoglycemia (P. 0.05, 0.02, and 0.01); respectively.

Table (9): This table presents the relation between the studied sample reported practices pre-test, post-test I and post-test II about adolescences has diabetes type 1 and their characteristics. It indicates an increase in reported practices scores in all practices areas at the post-test I and post-test II. However, this increase reached statistically significant difference between the adolescences age, sex, address, training courses and their reported practices (P. 0.00, 0.03, 0.05 and 0.000); respectively. It is evident that higher percentages of satisfactory reported practices in post-test I were observed among adolescences in the age from 19:21 years old (36%), the female(50 %), in rural area (72 %) and adolescences who didn't attended previous training course about diabetes type 1 were (60%) .

Table (10): This table discuses distribution of adolescences according to their reported practices regarding insulin management that 18%, 34%, 46%, 80%, 45%, and 18% of adolescences identify insulin name/type, stating the action/timing of insulin, using and rotating appropriate injection sites, using proper injection technique, using insulin pen, adjusting insulin figuring out correction doses, and safely disposing of my needles and sharps respectively. While increase in immediate post-test and second post-test of adolescences reported practices regarding insulin management. However, this increase reached statistically significant difference between the adolescences identify insulin name/type, stating the action/timing of insulin, using and rotating appropriate injection sites, using proper injection technique, adjusting insulin figuring out correction doses, and safely disposing of my needles and sharps (P. 0.000); respectively.

Table 7: Distribution of Adolescences According to Their Knowledge about Hyperglycemia or Diabetic Ketoacidosis (N =50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
1) Meaning of hyperglycemia:							
• Yes	22	44	37	74	35	70	X^2=0.55
• No	2	4	5	10	6	12	0.03*
• Don't know	26	52	8	16	9	18	
2) Signs and symptoms of hyperglycemia:	6	12	5	10	5	10	
• Flushed face and dry skin	7	14	5	10	7	14	
• Nausea, vomiting and fruity (acetone) breath odor							
• Drowsiness and lethargy unconsciousness ("diabetic coma")	9	18	3	6	5	10	X^2=0.63
• Don't know							0.01*
• All of the above							
	25	50	9	18	10	20	
	3	6	28	56	23	46	
3) Causes of hyperglycemia:							
• Insulin resistance	3	6	6	12	3	6	
• Very small amount of drugs	2	4	0	0	3	6	
• Stress	6	12	1	2	5	10	
• Illness and infection	2	4	2	4	1	2	
• Short time between meals and snacks	0	0	5	10	2	4	X^2=0.50
• Don't know							0.01*
• All of the above	34	68	10	20	11	22	
	3	6	26	52	25	50	

*= Significant

Table 8: Distribution of Adolescences According to Their Knowledge about Hypoglycemia (N =50)

Items	Pretest		Posttest I		Posttest II		P. value
	No	%	No	%	No	%	
1) Meaning of hypoglycemia							
• Yes	12	24	44	88	40	80	X^2=0.52
• No	6	12	3	6	5	10	0.05*
• Don't know	32	64	3	6	5	10	
2) Signs and symptoms of hypoglycemia							
• Sweating and palpitation	8	16	5	10	5	10	
• Blurring vision	4	8	3	6	3	6	
• Headache and pale skin color	2	4	0	0	0	0	
• Lack of concentration	4	8	0	0	0	0	X^2=0.64
• Loss of consciousness	10	20	4	8	8	16	0.02*
• Don't know	20	40	5	10	11	22	
• All of the above	2	4	33	66	23	46	
3) Causes of hypoglycemia							
• More exercise than usual	2	4	2	4	3	6	
• Large dose of drug	5	10	2	4	3	6	
• Long time between meal and snacks	1	2	2	4	2	4	
• Injury, illness, infection, or emotional stress	0	0	0	0	0	0	
• Small amount of food	3	6	2	4	3	6	X^2=0.43
• Don't know	35	70	5	10	10	20	0.01*
• All of the above	4	8	37	74	29	58	

*= Significant

Table 9: The Relation between the Studied Sample Characteristics about Have Diabetes Type 1 Reported Practices Pre-Test, Post-Test I and Post-Test II (N =50)

Items	Pre-test reported practices				Post-test I reported practices				Post-test II reported practices				P. value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		
	No	%	No	%	No	%	No	%	No	%	No	%	
1) Age in years:													
• Early adolescence (11:14)	4	8	11	22	12	24	3	6	11	22	4	8	
• Middle adolescence (15:18)	3	6	12	24	12	24	3	6	9	18	6	12	X^2=0.85 0.000*
• Late adolescence (19:21)	5	10	15	30	18	36	2	4	17	34	3	6	
2) Sex:													X^2=0.72
• Male	3	6	17	34	18	36	2	4	15	30	5	10	0.03*
• Female	7	14	23	46	25	50	5	10	25	50	5	10	
3) Address:													
• Rural	5	10	35	70	36	72	4	8	30	60	10	20	X^2=0.50
• Urban	2	4	8	16	10	20	0	0	10	20	0	0	0.05*
4) Training courses:													
• Yes	2	4	13	26	15	30	0	0	13	26	2	4	X^2=0.60
• No	10	20	25	50	30	60	5	10	28	56	7	14	0.00*

*= Significant

Table 10: Distribution of Adolescences According to Their Reported Practices Regarding Insulin Management (N =50)

Items	Pretest		Posttest II		Posttest I		
	No	%	No	%	No	%	P. value
• Identifying my insulin(s) name/type	9	18	40	80	35	70	X2=0.45 0.000*
• Stating the action/timing of my insulin(s)	16	32	44	88	39	78	X^2=0.75 0.000*
• Using and rotating appropriate injection sites	17	34	43	86	41	82	X^2=0.55 0.000*
• Using proper injection technique	23	46	47	94	45	90	X^2=0.62 0.000*
• Using the following injection devices:							
• Insulin Pen.	40	80	50	100	50	100	X^2=0.71 0.07
• Syringes	10	20	0	0	0	0	
• Pump.	0	0	0	0	0	0	
• Adjusting my insulin/figuring out correction doses	20	40	45	90	45	90	X^2=0.67 0.000*
• Safely disposing of my needles and sharps	9	18	43	86	40	80	X^2=0.48 0.000*

*= Significant

Table (11): this table reveals that 18% of adolescences examine foot daily and 32% check the temperature of the water before cleaning the feet. 56% of adolescences clean their foot daily with warm water and 46% of adolescences dry feet after cleaning, 28% drying between the toes but 12% use cream to moisturize the skin of the feet before program implementation. In addition 36% of adolescences wear comfortable shoes, and 22% examine the inside of the shoes before wearing, and 36% didn't go to the doctor when changes in the feet noticed, while in immediate posttest 80% of adolescences examine their foot daily and 88% check the temperature of the water before cleaning the feet. In addition 82% dry between the toes and 56% use cream to moisturize the skin of the feet. In addition 96%, 80 % and 90% of adolescences wear comfortable shoes, examine the inside of the shoes before wearing and don't walk bare footed, and 92% didn't go to the doctor when changes in the feet noticed.

Table (12): This table illustrates the studied adolescences have diabetes type 1 related to knowledge and reported practices in pre-test, post-test I and post-test II. It indicates an increase in satisfactory total scores of knowledge and reported practices in all areas at the post-program phase. However, this increase reached highly statistical significance difference for adolescences knowledge and reported practices (P. 0.00).

Table (13): This table shows the correlation between the total scores of adolescences knowledge and reported practices has diabetes type 1. It is evident that the highest strong positive statistical significant correlation was found between the total scores of knowledge and reported practices of adolescences who has diabetes type 1 in post-test phase (r=0.95) and the lowest strong positive statistical significant correlation was found between the total scores of knowledge and practice of adolescences who were in the pre-test program (r=0.78).

Table 11: Distribution of Adolescences According to Their Reported Practices Regarding Foot Care (N =50)

Items	Pretest		Posttest I		Posttest II		
	No	%	No	%	No	%	P. value
1) Examine of foot daily	9	18	40	80	30	60	X^2=0.71 0.77
2) Use appropriate temperature of water before cleaning of the feet	16	32	44	88	39	78	X^2=0.71 0.18
3) Clean feet daily with warm water	28	56	43	86	41	82	X^2=0.71 0.22
4) Drying of feet after cleaning	23	46	42	84	36	72	X^2=0.71 0.35
5) Always dry between the toes	14	28	41	82	33	66	X^2=0.71 0.86
6) Use of moistening cram to moisturize the skin of the feet	6	12	28	56	21	42	X^2=0.71 0.66
7) Cut the nails in the straightway and wearing comfortable shoes	18	36	48	96	36	72	X^2=0.71 0.45
8) Examination inside of shoes before wearing	11	22	40	80	40	80	X^2=0.71 0.60
9) Do not walk barefoot	22	44	45	90	35	70	X^2=0.71 0.30
10) Go to the doctor when changes in the feet noticed.	18	36	46	92	38	76	X^2=0.71 0.22

*= Significant

Table 12: The Mean Scores of the Studied Adolescences Have Diabetes Type 1 Related To Knowledge and Practice in Pre/Post and Follow Up Program (N = 50)

Items	Adolescence Students knowledge and reported practices pre-test, post-test I/ post-test II			X^2. Test	P. value
	Pre-test Mean ± SD	Post-test I Mean ± SD	post-test II Mean ± SD		
Knowledge	8.26±2.87	11.03±1.93	10.86±1.88	48.30	.000*
Reported practices	15.76±20.07	21.60±1.90	21.56±2.02	54.56	.000*

*= Significant

Table 13: The Correlation between the Total Scores of the Adolescences Pre- Test, Post-Test I and Post–Test II Knowledge and Their Reported Practices in the Program No = 50

Knowledge	Reported Practices Correlation Coefficient (r)	P. value
Pre	0.78	0.001*
Post-test I	0.95	0.001*
Post-test II	0.55	0.001*

*=Significant

7. Discussion

Diabetes mellitus is a syndrome with disturbed metabolism and improper hyperglycemia due to a deficiency either of insulin secretion or to a combination of insulin resistance and insufficient insulin secretion (American Diabetes Association, 2013). DM is a chronic disease that needs continuous care all the diabetic patient life specially at adolescent children (El-Samahy et al., 2001).

The aim of this study was to identify the effect of educational program on the adolescences knowledge and reported practices about type 1diabetes.

Regarding to characteristics of the studied adolescences having diabetes, the present study showed that, more than half of the studied adolescences were females. This finding in accordance with the data of (Ouda, 2006) who stated that more than half 56.5% of diabetic children were girls while 30% of them were boys. According to (American Diabetes Association; 2013) who reported also that, diabetes was common among females than males.

Regarding to the studied adolescences age, the finding of the present study showed that the age 19 < 21 years with mean and stander deviation 62±7.8 this finding not correspondent with (Tantawi et al., 2015) who state that the majority of ages of the studied children were between 7 < 12 years with mean and stander deviation 11.5±2.3. Moreover, this finding not correspondent with (Salem et al., 2003) and (Hussein, 2014) who reported that, the highest rate of diabetes in children between the ages of 6 to 11 years.

Regarding to the adolescences residence, the finding of the study revealed that more than two third of them were rural. This finding is in the same line with (Moawad et al., 2014) who reported that, a great majority of diabetic children were live in rural areas, who study The Incidence and Prevalence of Type. I Diabetes. In addition, this finding is disagreeing with (Salem et al., 2003) who mentioned that more than half of them were living in an urban area.

The World Health Organization (WHO) defines diabetes mellitus (DM) as a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. It is now one of the most common non-communicable diseases globally (WHO, 2008).

In this study the most of adolescences, before education they didn't know the meaning of DM but 78% of adolescences children in post- test, I know the meaning of DM. while 18 % didn't know any signs and symptoms of disease in pre-test, but two third of adolescences know the sign and symptoms of disease in after implementation of education program. This finding is in agreement with (Hussein, 2014) who reported that the highest percentage of adolescents have unsatisfactory knowledge about T1DM. This indicates to the need of adolescents to such knowledge and working together for providing all and updating knowledge of this age group, especially this age group being misunderstood from their relatives as being old enough and need no care from others.

In this study, most adolescences children didn't know the foods that should be avoided, and the foods that they are free to eat. While immediate posttest shows that most of adolescences children know all food that should be avoided completely and know foods that are eaten freely. This finding is in same line with (Moawad et al., 2014) who reported that, most of the children had limited knowledge related to nutrition and appropriate diet for

diabetes, cannot understand and follow food exchange and calculate calorie.

In this, study adolescences child didn't t know the complications of DM, but 18% of adolescences children know the most common complications of DM as low and high blood sugar, retinopathy, neuropathy. However, in immediate post-test, it is noticed that 64 % of adolescences children know the most common complications of DM This finding is in an accordance with (Moawad et al., 2014) who illustrated that diabetic children know these manifestations of diabetes mellitus hypo and Hyperglycemia after educational program.

Moreover, this finding (Wong et al., 2003) state that children (DM) is a serious disease, and it causes a number of chronic diseases the same as Ketoacidosis, cardiovascular disease, renal failure, and neuropathy. This result supported by (Janet et al., 2005) state of the American Diabetes Association " Proper diabetes education for a child and family about type 1 diabetes is intense and complex, and requires educators with a set of skills, including good communication, compassion, sensitivity, humor, and in-depth knowledge of childhood diabetes." In addition, Studies suggest that to be effective, educational interventions need to be ongoing.

In this study adolescences children have unsatisfactory reported practices regarding insulin management that of adolescences identify insulin name/type, stating the action/timing of insulin, using and rotating appropriate injection sites, using proper injection technique, using insulin pen, adjusting insulin figuring out correction doses, and safely disposing of my needles and sharps respectively. While increase in immediate post-test and second post-test of adolescences reported practices regarding insulin management.

The result of present study is in congruence with that reported by (Janet et al., 2005) as they found in their study that the most frequently reported barriers of adolescents for adherence with T1DM treatment were lacked of knowledge of a specific diet plan and lack of understanding of the plan of care and feeling of helplessness.

In addition, (Nagelkerk, 2006) they consider negative perception about medication regimen as one of the hindering factors of adolescents' self-management with T1DM. This result is supported by (Taddeo, 2008) who reported in a similar study that there are certain factors that affect negatively on adolescents' adherence to treatment, which are therapeutic regimen, complex therapy and medications with side effects, adolescent's perception about efficacy of proposed therapy and attitude toward therapeutic regimens.

8. Conclusion

Based on result of the present study the adolescences has diabetes type 1 in out patients clinic for diabetes at Minia University Hospital for Obstetrics and Pediatrics. were lacking the necessary basic knowledge and reported practices related to diabetes type 1 so, educational program was based on adolescences needs of knowledge and reported practices, this came from pre-test results. By the implementation of the program, there was remarkable improvement of adolescences children knowledge and reported practices, it was clear in post-test, I and post-test II results. By the end of the program there was successful in correcting the deficiency in adolescences knowledge and reported practices regardless to their age, sex and residence.

9. Recommendations

Based on results of the present study are: The developed program should be applied and repeat again every 6 months. In the same study setting and adopted in other similar settings with required modifications, provision of continuing education programs. On regular basis is suggested in order to refresh and update adolescences children knowledge about diabetes type 1. As well as reinforce proper practices related to diabetes type 1 in outpatient clinic for diabetes, continuous supervision and evaluation for adolescences children is needed to determine any defect related to knowledge or practices about diabetes type 1

References

[1] Craig M, Hattersley A, Donaghue K. (2009): Definition, epidemiology and classification of diabetes in children and adolescents. Pediatr Diabetes. 10: PP: 3–12 https://doi.org/10.1111/j.1399-5448.2009.00568.x.

[2] World Health Organization, (2012). Global status report on noncommunicable diseases 2014. Geneva, ISBN 978 92 4 156422 9.

[3] Center for Disease Control and Prevention, (2011). National Diabetes Fact Sheet, 2011. Atlanta, GA: Centers for Diseasehttp://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf

[4] El-Ziny A.M. , Salem A. N., El-Hawary K.A., Chalaby M.N. and Elsharkawy A.A. (2014): Epidemiology of Childhood Type 1 Diabetes Mellitus in Nile Delta, Northern Egypt - A Retrospective Study. J Clin Res Pediatr Endocrinol. 6(1): PP: 9–15. https://doi.org/10.4274/Jcrpe.1171.

[5] Seaquist, E.R., Anderson, J., and Childs, B. (2013). Hypoglycemia and diabetes: a report of a workgroup of the American Diabetes Association and the Endocrine Society. J Clin Endocrinol Metab, PP: 98:1845. https://doi.org/10.1210/jc.2012-4127.

[6] George, B.J. (2012). Nursing Theories- The base for professional Nursing Practice, 3rd ed. Norwalk, Appleton & Lange. www. currentnursing.com/...theory/self_care_deficit_ theory

[7] Perrin, B.M., Swerissen, H., and Payne, C. (2009): The Association between foot –care self efficacy beliefs and actual foot- care behavior in people with peripheral neuropathy: a cross sectional study. Journal of foot and ankle research; 2(3):1-8. found online at: http/ / www. Jfootankleres.com . retrieved at 3-2012

[8] WHO ranks Pakistan 7th on diabetes list. The Nation, November 15, 2008. Available at: www.nation.com.pk.

[9] Hakeem R, Fawwad A, (2010): Diabetes in Pakistan: Epidemiology, Determinants and Prevention. J Diabetol; PP: 3:4.

[10] American Diabetes Association; 2013.complete guide to diabetes, 4th ed., Koncept, Inc.; p. 7.

[11] El-Samahy M., Ibrahim W., and Arafa S., (2001): "The Problem of Osteopenia in Diabetic Children and Adolescents"; Egyptian Journal of Pediatrics.18 (3): PP: 549-570.

[12] Ouda W, Amin E & Zidan H. (2006). Diabetic Complications Among Controlled Versus Uncontrolled Diabetic Children, Master Thesis,Faculty of nursing, Ain Shams University, Cairo, PP: 145.

[13] Tantawi HR., Amin FM., Fakhry SF. (2015): Quality of Life for Children Suffering from Diabetes Mellitus. 4(3):PP: 68-71

[14] Salem M., El-Laboudy M., and Moustafa M. (2003): Plasma Renin Activity and Microalbuminuria are Early Predictors of Nephropathy in Children and Adolescents with Type I. Diabetes Mellitus, 20(1): PP: 31-146.

[15] Hussein HA., Abdel S.B.R. (2014): Hindering Factors of Self-Management in Diabetes Mellitus as Perceived by Adolescents Versus Mothers.29(1):PP: 9-19

[16] Moawad S., Badawy AS., Al-saffar ZA., Al-Hamdan N., Awadien A.M. 2014. Assessment of knowledge among Saudi diabetic children/ adolescent at Riyadh city.3(1):PP: 6-12

[17] Wong DL, Hockenberry MJ, Wilson & Wong's (2003): Nursing Care of Infants and Children. 7th edition. St Louis: Mosby Company.; pp. 1861-1880.

[18] Janet Sil Verstein, Georgeanna Klingensmith (2005): Care of Children and Adolescents With Type 1 Diabetes. Diabetes Care, Vol. 28, Number 1.

[19] Nagelkerk JK. Reick L. Meengs (2006): Perceived barriers and effective strategies to diabetes self-management. J Adv Nurs., 54: PP: 151-8.

[20] Taddeo DM. Egedy JY. Frappier (2008). Adherence to treatment in adolescents. Pediatric Child Health, 13: PP: 19-24.