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Effectiveness of Video- assisted Training on Insulin Self-Administration Level among Adolescents with Type 1 Diabetes

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Abstract: Insulin therapy is a cornerstone of treatment in type 1 diabetes among children with the right self-insulin administration. The use of video showing in pediatric training is considered a powerful and attractive technic. This study aimed to evaluate the effectiveness of video-assisted training on insulin self-administration level among adolescents with type 1 diabetes. Quasi experimental research design was adopted. A study was carried out with 40 children from Children University Hospital. A structured interview schedule and observational checklist on self-administration of insulin were used to collect the data. Children were trained after the pre-test by video demonstration method and post-test was implemented during the first dose of insulin injection after eight days of training. The study found that more than half (67.5%) of the sample was males with mean age of 14 ± 1.70 years. Only 15% of cases were have adequate total knowledge pre-video intervention, compared to about three quarters (72.5%) of them were have adequate total knowledge post-video intervention and about one quarter (22.5%) of cases were have adequate total practice pre-video intervention, and the majority of cases (85.5) were have adequate total practice post-video intervention. Thus, the video-assisted teaching regarding insulin injection regarding self-administration of insulin for diabetic adolescent was effective in enhancing and improving the Knowledge and practice skills among diabetic adolescent.

Keywords: Video-assisted Training, Self-Administration, Insulin Injection, Adolescent, Type 1 Diabetes.

INTRODUCTION

Diabetes mellitus type 1 is the most common endocrine disorder of childhood whose incidence is growing annually worldwide by 3-4% and for children up to 7 years even to 7%⁽¹⁾. Diabetes prevalence at Egypt has extended epidemic scopes. Egyptian measurements presented that diabetes is the 11th most vital cause of children death. Furthermore, the WHO reported that 5%-9.9% of the total will have diabetes mellitus by 2030, it is estimated to have 6.7 million diabetic children and is the sixth utmost vital cause of disability weight in Egypt by the year 2030 in Egypt^(2,3).

Insulin treatment of adolescent with diabetes is most serious needs due to their repaid growth, development and daily activities. The usage of long-acting and fast-acting insulin therapy of children of all stages considerably decrease the occurrence of hypoglycemia and enhanced metabolic rule of diabetes due to a more accurate dosage of insulin for mealtimes. However, the difficult still of an increase number of insulin injection and overload of the injection site and complicates rule of diabetes and decrease the quality of life⁽⁴⁾.

Confrontation to insulin treatment in both pediatric patients and providers is a main problematic, as explained by the milestone of DAWN Study (Diabetes Attitudes, Wishes, and Needs)⁽⁵⁾. It is necessary for adolescents with diabetes to have enough knowledge and ability to take responsibility for their gain insulin treatment, activity and hygienic care and it is clear that as children age and methods of training for

insulin injection as videos, their ability to administer insulin improves⁽⁶⁾.

Diabetes self-management education (DSME) is a vital item of care for adolescents with diabetes and is essential to advance pediatric patient outcomes, and is the current development of enabling the knowledge, practice, and ability essential for diabetes self-care⁽⁷⁾. Secure self-care of insulin likewise needs evaluation of the individual's mental and physical capabilities to follow orders and achieve the injection skill. Adolescence is noticeable by a development in the skill to produce possibilities, to sight circumstances from many views at the similar period, to recognize and expect long-term consequences, and to evaluate the reliability and importance of information⁽⁸⁾.

Nurses must begin by assessing diabetic adolescents for their current level of knowledge and understanding of diabetes and subcutaneous insulin use, as well as their level of cognition and overall willingness to learn. Also, nurses must be educate diabetic adolescents about some recommended elements such as; knowledge about the medication(s) to be directed, injection sites, site rotation and sterile procedure, select of injection device, correct storage of inject able drugs, containing expiration date alertness, injection technique, injection pain and complications and discarding of used sharps⁽⁹⁾.

The usage of video in educational locations is going faster in departments through all corrections from people, sciences, and arts to constant practiced skills. Video not be used only for teaching, but also for learning and education inside and

outside the classroom. Video in specific is often smart as a means to imprisonment lecture relaxed and give direct instruction. Of all the technological mechanisms included in the learning sitting, it is often the best visible and the furthestmost supply intensive. It is easy then to accept that it will be the greatest effect particularly for children and adolescents⁽¹⁰⁾.

Significance of the study:

For diabetes care to be effective it is essential that insulin is ordered properly. Insulin is one of the destruct-full treatments if used incorrectly. For this cause, it is known as one of the five "great alert" drug that have the highest danger of producing damage to adolescents for drug mistakes. However these offerings confront in front of the complications related with insulin usage and also taking into attention the possible hazards related with unsuitable usage. Inadequate knowledge of insulin self- injection can cause avoidable problem, opposing pediatric patient out came full devotion to treatment and always reduced glycemic regulator⁽¹¹⁾.

Diabetes treatment is especially difficult for children and adolescents because this age group is highly resistant to restrictions in lifestyle or to divergence from the peer group. Children often react against adult control and respond with denial, rejection, and poor diabetes self-care, which can lead to emergencies and exacerbate long-term problems. Also, decrease the vital role of insulin treatment in the managing of type 1 diabetes, cooperated obedience is also usual in younger diabetic with this illness, with numerous weakening to shadow their management strategies. Mistakes in insulin addition limit the skill of some diabetic children to achieve glycemic objectives⁽¹²⁾. According to two recent studies, at least 1/3 of adolescents miscarry to receipts their insulin as recommended and 20% of pediatric patients purposely miss their dosages⁽¹³⁾.

AIM OF THE STUDY

This study aimed to evaluate the effectiveness of video-assisted training program on self-administration level of insulin injection among adolescents with type 1 diabetes.

Research hypothesis:

The following hypotheses were expected:

1. Adolescents with type 1 diabetes attained the program be higher knowledge regarding insulin injection than before they attained.
2. The levels of insulin injection practice among adolescents with type 1 diabetes at post program are higher than those pre-program.
3. Personal characteristics may influence on levels of self-administration of insulin injection among adolescents with type 1 diabetes.

SUBJECT AND METHODS

Research design: Quasi experimental design (one group pre-test post-test) was utilized to conduct this study.

Research setting: The study was carried out in diabetic out-patient clinic at The Children University Hospital. It is working on Monday and Wednesday/week from 9am to 1pm. The total number of cases admitted at endocrine unit

for each week is from 7 to 10 children for treatment and from 3 to 4 children were coming to the diabetic unit out-patient clinic each day (Monday/ Wednesday) for follow up. The total number was 50 children were recruited within a period of 12 months from January and December 2016.

Sampling:

The children were selected using purposive sampling technique.

Sample size: All type one DM who has follows up on Children University Hospital was included in the study. A total of 40 adolescents with type 1 diabetes were taken with the following inclusion criteria: 1) type 1 diabetic patient attending at Assiut University Children Hospital follow up clinic. 2) Age range between 12-18 years. Type 1 diabetes adolescents who were severely ill and had visual or hearing impairment patients were excluded from the study. Sample size was dependent on the availability number of adolescents were registered for follow up in diabetic out-patient clinic at Assiut University Children Hospital

Tool:

Two tools were used to accomplish this study:-

Tool (1): A structured interview schedule: It was developed by the investigators based on reviewing the relevant literatures, it included three parts: -

- **Part I:** personal data, such as age, sex, education, residence.
- **Part II:** History of the disease, its onset, duration, treatment, if have any training program.
- **Part III:** Knowledge questionnaire on self-administration of insulin consisting of 12 questions about diabetes and insulin self-administration. The adolescents' knowledge was calculated for each item as follows: correct complete answer was scored (2 points), incomplete correct answer was scored (1 point), while wrong answer or don't know was scored (zero point). The total score for all questions related to knowledge was 24 points which represented 100%

Tool (2): Observational check-list: for evaluating the practice skill of the self-administration of insulin. The insulin application skill form is 17-item skills list, which was prepared according to injection technique proposed by the **American Association of Diabetes Educators (AADE) (2004)**⁽¹⁴⁾. The child was observed directly by a nurse experienced in diabetes, and he used his own equipment. For adolescents' practice assessment "done" scored as two and if "not done" scored as zero. The total score of practices was 34 points.

Validity: The tools were prepared, translated and reviewed to ascertain their content validity by five experts of pediatrics in nursing and medicine. The recommended modifications were done accordingly, and then the tools were designed in its final format. The validity was 97.6%.

The reliability was assessed in the pilot study and it was estimated by alpha Cronbach's test for the observational checklist on self-administration of insulin tool and its result was R=0.883.

Methods of data collection:

An official letter approval was obtained from the Dean of Faculty of Nursing, Assiut University to the Director of Assiut Children Hospital. This letter included a permission to carry out the study and explain the purpose and nature of the study. Meetings with out-patient clinics' manager to explain the objectives and contents of the program and the methods for applying the program were help to gain their cooperation.

Pilot study was carried out including on 10% of the study sample to assess the tool clarity, applicability, and time needed to fill each sheet. The participants of the pilot study were excluded from the main study sample. The actual field work started from beginning of data was collected in the period from first of April to the end of the September.

Video-assisted training program included four phases: Phase I (preparatory phase):

The researchers interviewed the child to explain the purpose of the study and reassure him that all data and results will be confidential. Each diabetic adolescent was interviewed individually for assessing his current level of self-administration of insulin and observational checklist on insulin self-administration, as well as their level of cognition and overall willingness to learn. Researchers faced the adolescents, asked them the questions in Arabic and recorded their answers in the structured interview schedule. The interview was carried out in the waiting area at the diabetic out-patient clinic and it took about 15-20 minutes for each one. For the assessment of insulin application skills, the child was observed directly by a nurse experienced in diabetes, and the form filled in. Before the observation, the children were asked to administer their insulin in the way that they usually do and use their own equipment, without help from a nurse.

Phase II (program planning): the program was designed based on the identified needs of adolescent with diabetes regarding self-administration of insulin injection. Prepare and check the video device before showing the material.

- Teaching time: The time of teaching sessions started at 8.5 Am until 11.5 Am.
- Teaching place: The program conducted in sitting room beside diabetic out-patient clinic at Assiut Children Hospital.

Phase III (program implementation): The training on self-administration of insulin injection was given by one to one teaching through three sessions (lecture, demonstration and video showing) on the same day and each session lasted 45-60 minutes. Then the adolescents were asked to re-demonstrate for next two doses of insulin injection. The program was presented in clear and concise form and focused on the point of learning using different teaching methods, as illustrative lecture, group discussion, role playing, demonstration, and re-demonstration were used. Also pamphlets were used to facilitate the teaching of each topic.

Phase IV: Post-test was done on day eight by using the same tools to assess adolescents' knowledge regarding insulin self-administration. For the assessment of

adolescents' practice regarding insulin application skills, the child was observed directly by an experienced nurse in diabetic out-patient clinic.

Operational Definition:

Satisfactory knowledge level: a study participant who total score from correct answers about knowledge questions was $\geq 60\%$

Unsatisfactory knowledge level: a study participant who total score below 60%

Insulin self-administration –the injection of insulin expected to be administered at home without assistance. This includes preparation of article, with drawl of injection, and administration after care. According the study final adolescents' practice score were categorized as adequate practice $\geq 60\%$ and inadequate practice $<60\%$.

Ethical considerations:

All the relevant principles of ethics in research were followed. The study protocol was approved by the pertinent authority. Participants' formal consent to participate was obtained after informing them about their rights to participate, refuse, or withdraw at any time. Total confidentiality of any obtained information was ensured. The study questionnaire doesn't entail any harmful effects on participated children.

Statistical design: The collected data was analyzed using Statistical Package for Social Science (SPSS) version 20. Descriptive and inferential statistics were calculated for socio-demographics, respondents' healthy practices while chi-square was used for inferential statistics of studied parameters.

RESULTS

Table 1: Distribution of personal characteristics of studied diabetic children (No. =40)

Items	No.	%
Age		
12- <14 years	10	25.0
14- <16 years	18	45.0
16- ≤18 years	12	30.0
Mean	14±1.70	
Gender		
Male	27	67.5
Female	13	32.5
Level of education		
Non educated	18	45.0
Primary	3	7.5
Preparatory	9	22.5
Secondary	10	25.0
Residence		
Rural	23	57.5
Urban	17	42.5
Exposure to mass media (daily)		
Reads books	1±1.80	
Watches TV	7±4.00	
Social media	19±1.8	
Attendance Training courses about insulin injection	4±3.13	
Yes	4	10.0
No	36	90.0

Personal characteristics of the studied adolescents presented in **table (1)**. It was noticed that the high percentage of the studied children (45 %) were in 14- <16 years with mean age 14 ± 1.70 and were uneducated. About two thirds (67.5%) of the studied adolescents were males and 57.5% of them were coming from rural area. Also, the highest mean scores among those children was in using the social media and only 10 % were attending training courses about insulin injection.

Table (2):- Distribution of clinical history among studied diabetic children

Item	(n=40)	
	No	%
Diabetes duration		
<3 years	19	47.5
4- 7 years	12	30.0
7-10 years	9	22.5
Injections per day:		
2 dosages	22	55.0
4 dosages	18	45.0
Family history of diabetes		
Yes	27	67.5
No	13	32.5

Table (2) shows distribution of clinical history among studied diabetic children. It was found that more than two-thirds (67.5%) of the studied children had family history of diabetes. Concerning duration of diabetes, 47.5% of the adolescents were less than three years and more than half of them (55 %) were taking two doses of insulin daily.

Table (3):- Diabetic adolescents' knowledge (Correct) regarding diabetes and insulin administration throughout intervention program phases (pre and post intervention)

Items	Pre		Post		P-value
	No.	%	No.	%	
1-Knowledge concerning the diabetes					
a. Definition of diabetes	12	30.0	36	90.0	<0.001**
b. Types of diabetes	9	22.5	34	85.0	<0.001**
c. Etiology of diabetes	11	27.5	36	90.0	<0.001**
d. Manifestations of diabetes	22	55.0	38	95.0	<0.001**
e. Diagnostic Evaluation	14	35.0	29	72.5	0.002**
f. Diabetic complications	12	30.0	38	95.0	<0.001**
g. Treatment:	8	20.0	37	92.5	<0.001**
2-Knowledge concerning insulin administration					
A. Types of insulin	9	22.5	29	72.5	<0.001**
B. Storage of insulin vial	7	17.5	30	75.0	<0.001**
C. Site of insulin injection	14	35.0	39	97.5	<0.001**
D. Insulin injection complications	5	12.5	33	82.5	<0.001**
E. Insulin self-administration benefits	4	10.0	36	90.0	<0.001**

****Highly Statistically significant difference (p<0.01)**

The comparison between pre and post intervention correct knowledge regarding diabetes and insulin administration among diabetic adolescents in the study is displayed in the **table (3)**. It points to statistical significance differences

between the two groups in the areas of knowledge related to diabetes and insulin administration ($p= 0.001$) with great improvement in the knowledge of the studied children after the intervention.

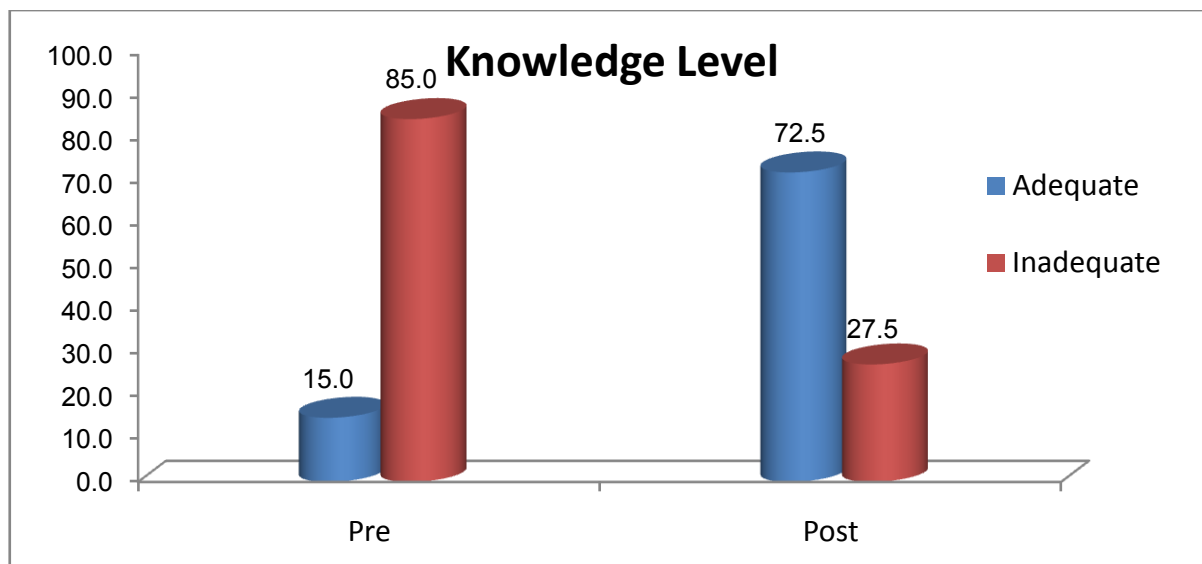


Figure (1): Percentages distribution of the total diabetic adolescents' knowledge level regarding insulin self-administration (Pre & Post video intervention)

Figure (1) clarifies the percentages distribution of the total diabetic adolescents' knowledge level regarding insulin self-administration (Pre & Post video intervention). It points to a

sharp statistically significant rise of the percentage of adequate total knowledge level from (15 %) at pre-program to 72.5 % at post-test level ($p < 0.001$)

Table (4):- Diabetic adolescents' practices regarding insulin self-administration throughout intervention program phases (pre and post intervention)

Items	Pre		Post		P-value
	No.	%	No.	%	
1. Wash hands with soap and water.	0	0.0	36	90.0	<0.001**
2. Check insulin's expiration date	0	0.0	27	67.5	<0.001**
3. Inspect insulin color before each use.	3	7.5	29	72.5	<0.001**
4. Check air into vial for syringe injection	26	65.0	36	90.0	0.016*
5. Dosing accuracy	20	50.0	34	85.0	0.001**
6. Choosing the right injection site	12	30.0	36	90.0	65.0
7. Rotate site for each injection.	6	15.0	36	90.0	<0.001**
8. Make sure injection site is free of bumps, cracks or scarring.	11	27.5	38	95.0	<0.001**
9. Use a new syringe for each injection.	27	67.5	29	72.5	0.807
10. Clean injection site by alcohol and wait to evaporate completely	9	22.5	36	90.0	<0.001**
11. Insert the Needle	34	85.0	40	100.0	0.033*
12. Complete injection	38	95.0	38	95.0	0.608
13. Waiting for 10 seconds without taking out needle after injection	2	5.0	29	72.5	<0.001**
14. Applying pressure on injection site	21	52.5	36	90.0	0.001**
15. Put used needle into a "sharps" container when syringe injection	15	37.5	34	85.0	<0.001**
16. Dispose the other used materials correct	21	52.5	36	90.0	0.001**
17. Hand washing with soap and water.	2	5.0	38	95.0	0.001**

* Statistically significant difference ($p < 0.05$), **Highly Statistically significant difference ($p < 0.01$)

Table (4): shows diabetic adolescents' practices regarding insulin self-administration throughout intervention program phases (pre and post intervention). It was found that diabetic adolescents had practice skills deficit regarding insulin self-administration and common their errors in most items related to safe administration of insulin as wash hands, check insulin's expiration date, inspect insulin color before each use, rotate site for each injection, sure injection site is

free of bumps, cracks or scarring and clean injection site at pre-intervention. Also, it indicates there is an improvement in the practices skill of the studied children after the intervention of video sessions with statistically significant differences ($p = 0.001$). It is evident that video-assisted training program teaching was effective in improving the technique of self-administration of insulin.

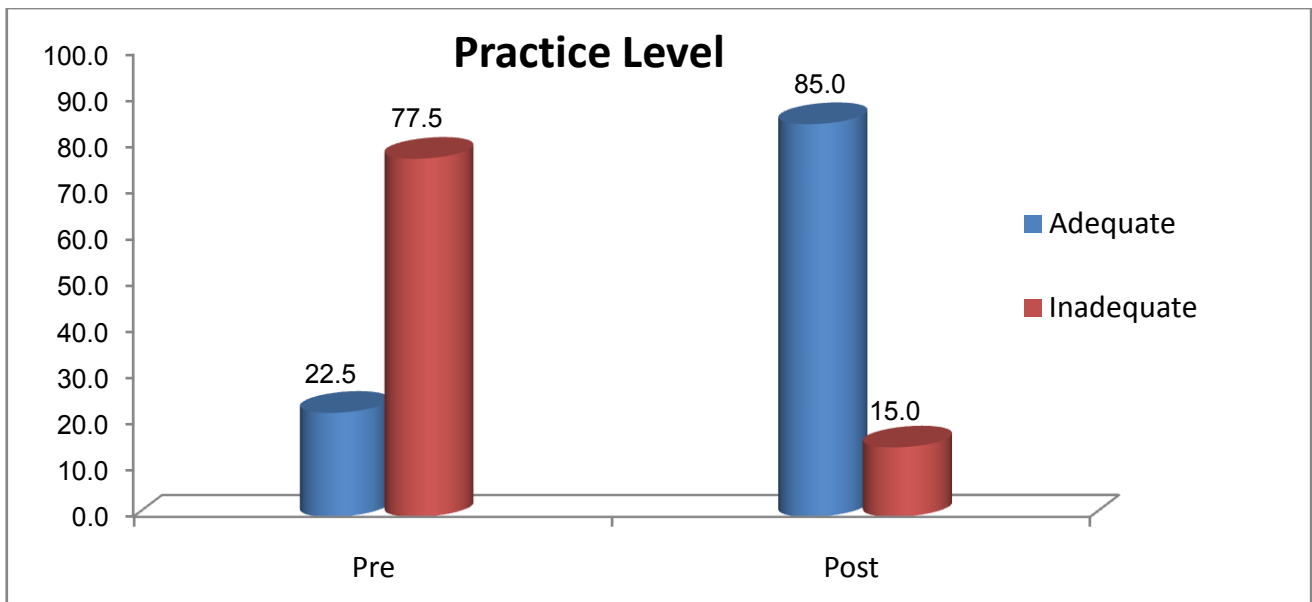


Figure (2): Percentages distribution of the total diabetic adolescents' practice regarding insulin self-administration (Pre & Post video intervention)

Figure (2) Clarifies the percentages distribution of diabetic adolescents' practice level regarding insulin self-administration (Pre & Post video intervention). It was noticed that only 22.5% of diabetic adolescents' had

adequate practice level at pre-video intervention compared to the majority of them (85.5%) have adequate level after the intervention.

Table 5: Comparison between Mean, and 't' values of diabetics adolescents' knowledge and practice scores regarding insulin self-administration throughout (pre and post intervention)

Items	Mean	Mean differences	Standard deviation	t	P
Knowledge					
- Pre-test	21.58	-18.875	7.82	-10.732	<0.001**
- Post-test	40.45		7.91		
Practice					
- Pre-test	6.43	-5.750	3.62	-8.042	<0.001**
- Post-test	12.18		2.71		

* Statistically significant difference (p<0.05), **Highly Statistically significant difference (p<0.01)

Table (5): Shows Comparison between mean and 't' values of diabetics adolescents' knowledge and practice scores regarding insulin self-administration throughout intervention program. Statistically significant difference was found

between the mean, mean difference, standard deviation and't' values of pre-test and post-test knowledge and practice scores regarding insulin self-administration (p <0.001).

Table (6) Relationship between adolescents' pre-intervention knowledge and practice regarding insulin self-administration and their personal characteristics

Items	Knowledge (n=40)				P.value	Practice (n=40)				P.value
	Satisfactory (6)		unsatisfactory(34)			Adequate (9)		Inadequate(31)		
	No	%	No	%		No	%	No	%	
Age										
12-<14	0	0.0	10	29.4	0.007**	3	33.3	7	22.6	0.004**
14-<16	1	16.7	17	50.0		0	0.0	18	58.1	
16-≤18	5	83.3	7	20.6		6	66.7	6	19.4	
Gender										
Male	2	33.3	25	73.5	0.142	2	22.2	25	80.6	0.003**
Female	4	66.7	9	26.5		7	77.8	6	19.4	
Level of education										
Non educated	0	0.0	18	52.9	0.049	1	11.1	17	54.8	0.044*
Primary	0	0.0	3	8.8		2	22.2	1	3.2	
Preparatory	3	50.0	6	17.6		2	22.2	7	22.6	
Secondary	3	50.0	7	20.6		4	44.4	6	19.4	
Residence										
Rural	3	50.0	20	58.8	0.964	6	66.7	17	54.8	0.706
Urban	3	50.0	14	41.2		3	33.3	14	45.2	
Attendance Training										

courses										
Yes	4	66.7	0	0.0	<0.001**	4	44.4	0	0.0	0.001**
No	2	33.3	34	100.0		5	55.6	31	100.0	
Diabetes duration										
<3 years	2	33.3	17	50.0	0.014	3	33.3	16	51.6	0.200
4-< 7 years	0	0.0	12	35.3		2	22.2	10	32.3	
7-10 years	4	66.7	5	14.7		4	44.4	5	16.1	
Injections per day:										
2 dosages	3	50.0	19	55.9	0.858	4	44.4	18	58.1	0.058
4 dosages	3	50.0	15	44.1		5	55.6	13	41.9	
Family history of Diabetes										
Yes	5	83.3	22	64.7	0.067	6	66.7	21	67.7	0.731
No	1	16.7	12	35.3		3	33.3	10	32.3	

* Statistically significant difference (p<0.05), **Highly Statistically significant difference (p<0.01)

When examining the relationship between diabetic adolescents' knowledge and practice regarding insulin self-administration and their personal characteristics **table (6)** revealed that there were significant relations between the total knowledge and practice of the studied children and some of their personal characteristics (age, gender and level

of education). It was noticed that percentages of the satisfactory knowledge level and adequate practice were higher among adolescents with older age $16 \leq 18$ years (p=0.004), were female (p=0.003) and those having Secondary level of education (p=0.04).

Table 7: Correlation Co-efficient of pre-test and post-test knowledge and practice scores regarding insulin self-administration (n=40)

	Mean \pm SD	R	P
Knowledge	31.01 \pm 12.3	0.766	<0.001**
Practice	9.3 \pm 4.3		

* Statistically significant difference (p<0.05), **Highly Statistically significant difference (p<0.01)

Table (7): Shows the correlation co-efficient of pre-test and post-test knowledge and practice scores regarding insulin self-administration. Statistically significant difference was found between correlation co-efficient of pre-test and post-test knowledge and practice scores regarding insulin self-administration.

DISCUSSION

Type 1 diabetes is a main spare medical and community health problematic in Egypt. The diabetic children wanted to be knowledgeable about the disease and insulin treatment and also they must have a competency self-administration of insulin injection to overwhelm the blockades of insulin injection and to have worthy glycemic control. Therefore, a study was conducted to evaluate the effectiveness of video-assisted training program on self-administration level of insulin injection among adolescents with type 1 diabetes present at Assuit University Children Hospital.

The findings of the present study show that the high percentages of the participant adolescents were under 14-16 years with mean age 14 ± 1 and males. This is may be related to the higher risk of developing T1DM under age 15.⁽¹⁵⁾ Also Dia-Mond Project Group reported that the age group 10-14 years had about twice the risk of developing T1DM.⁽¹⁶⁾ In addition, this age is suitable for teaching the adolescents self-care management. This finding in of the same line with **Streisand et al** who suggest that children should not start taking full responsibility until 15-16 years of age.⁽¹⁷⁾ Similar findings by a descriptive cross sectional study was showed by **Karnataka et al** with type 1 diabetes children aged above 10 years to assess the knowledge, attitude and practice of diabetes children showed mean age was 13.64 ± 1.3 years, 67% were 11 males.⁽¹⁸⁾ Also,

Egyptian study directed by **Ali** who establish that considerably more than half of the studied sample was male.⁽¹⁹⁾

In the current study, more than two thirds of the studied sample was impending from rural zones. This may perhaps credited to the life style, environmental factors and the illiteracy of health prevention by rural residents. The present study finding agrees with **El-Ziny et al** in Egypt; who said that the high prevalence of diabetes mellitus was found in rural population. This could be related to accidental exposure of children living in these areas to certain environmental β -cell toxins such as organ-ophosphorus compounds including insecticides, rodenticides and pediculicide.⁽²⁰⁾

The current study results associated to clinical history demonstrated that there is a positive family history of diabetes among studied sample, and their duration of diabetes and insulin injected was less than 3 years. Likewise these findings were found in **Mahdi et al** study which illustrated that nearly half of studied sample had positive family history of diabetes.⁽²¹⁾

The first measurement that has been explored in the existing study was the assessment of diabetic adolescents' knowledge about different subjects related to diabetes and insulin administration and practice of insulin self-administration before the program. This assessment was done in order to evaluate the basic adolescents' knowledge and practice, and to identify defects areas that need to be managed accordingly. According to the present study results, before the training program, adolescents had poor knowledge about diabetes and insulin administration, this was indicated by their low scores. This poor knowledge

noticed among adolescents might be ascribed to the high percentage of them were uneducated and came from rural area. This finding is supported by **Ali** study, which conducted in Helwan city (Egypt) and the majority of studied sample had deficient knowledge concerning all basic parameter of diabetes monitoring and complications before the program phase.⁽¹⁹⁾ Also, **Gerensea et al** have similarly noted a poor knowledge about insulin self-administration among type 1 diabetic patients in Mekele Hospital.⁽²²⁾

Diabetes insulin therapy trusts on the right injection method for best consequence. Immediate problems, such as hypoglycemia (when insulin is injected inside the muscle where it is immersed at a fast degree), and/or hyperglycemia (when the insulin is injected inside an area where it is sick engrossed) can be produced by improper method, such as usage of unsuitable needle length, disappointment to rotate the injection sites, as well as the reuse of needles, can led to inject able treatments actuality absorbed in an irregular way.⁽²³⁾ In this regard, another important assessment of the current study was insulin self-administration practice and was noticed that there is inadequate practice level and mistaken in items related to safe administration among diabetic adolescents before video training program. This is in the line with Egyptian study conducted by **Ramzy** which presented that majority of studied sample had improper practice at pre intervention.⁽²⁴⁾ Similar results reached by **Ali**, who reported that none of the studied patients had adequate self-care skills related insulin, self –injection.⁽¹⁹⁾ These deficiencies of diabetic adolescent knowledge and practice regarding diabetes and insulin self-administration in the current study indicates that lack of adequate organized health education and also, the health care providers do not give health education for these patients.

In the present study the effect of the video-assisted training program on diabetic adolescents' knowledge and practice regarding self-administration of insulin was the second dimension that has been explored. After implementation of the program, statistically significant improvements were shown in adolescents' knowledge regarding all aspects of diabetes included in the program and the mean score after the education program were increased in comparing between pre-test and post-test, and the p-value of t-test was very highly significant. Similar improvements were also exposed in their self-administration of insulin skill.

These findings indicate success of the program in realizing the research hypotheses. This success of the program can be attributed to many reasons. First, Adolescent are ready to take on the majority of responsibility for their insulin administration according to their knowledge and skills due to hand–eye coordination significantly improves, together with mental and motor skills.^(25, 26) Also, training by video consider the most effective training methods for children compares to different training methods pictures, lectures or listening especial in self-care.⁽²⁷⁾ In addition, the program was individualized according each patient needs and emphasized the practical part which provides the patient with skills that make him/her feel independent. In agreement with these findings, the study done in Erbil City by **Al-Banna and Khuder** which showed that the mean score of

post-test self–insulin management knowledge and skill of diabetic children were more than the mean pre-test with highly significant difference between pre-test and post-test ($< 0,001$), that is connected to the effectiveness of individual prearranged teaching program which the investigators done for them.⁽²⁸⁾

On studying the relation between diabetic adolescents' knowledge and practice regarding insulin self-administration and their personal characteristics, the present study answers exposed the total knowledge and practice were significantly increase as age increases. This finding reinforced by **Ekim and Pek** who found that Increasing age was again significantly correlated with an increase in correct administration skills ($p=0.01$)⁽²⁹⁾

According to the present study results, the adolescents' education level had a significant relation to improvement of knowledge and practice. The results indicated that higher education level got more satisfactory knowledge level and more adequate practice score The findings are congruent with **Berhe et al** who clarified that significant association was obtained between respondents' level of education and their knowledge and practice level ($P<0.001$).⁽³⁰⁾

Regarding integrating knowledge into practice, the present study has demonstrated statistically significant association between knowledge and practice, with satisfactory knowledge concerning self-administration of insulin actuality related with more adequate practice. This finding is quite expected and is congruence with **Parecatty** who confirmed that there is a positive correlation ($r=0.74$, $p<0.05$) between knowledge and skill of self-administration of insulin among diabetic patients.⁽³¹⁾

One of the limitations of the present study was that the data related to diabetic patients who were on subcutaneous insulin therapy. Another limitation of the study was related to only one site was included in children university hospital

CONCLUSION

The study concluded that the diabetic adolescents had poor knowledge and inadequate practices regarding self-administration of insulin injection and improved after video training. The study findings reveal that there is the great positive relationship between the knowledge and skill level of self-administration of insulin.

Investigators have observed some of the motivating conclusions during the study. Though initially many adolescents with family history of diabetic disease, higher age and females having better knowledge and practice than others.

RECOMMENDATIONS

The findings of the study have greater consequences for health care professionals in the areas of practice, administration education, and research. Pediatric nurses play a key role in children care especially adolescents from the day of admission to the day of discharge; nurse is with the pediatric patients, caring and consoling. So, the nurse is

expected to give nursing care as well as health teaching by video regarding self-practice of insulin administration. Health care professional needs to take initiative in directing, teaching and educate the adolescents about self-administration practices by attractive ways (video) it can be better understood by the children, family members and the community at large.

REFERENCES

- [1]. **Stipancic G, La GrastaSabolic L, Malenica M (2008)**:Incidence and trends of childhood Type 1 diabetes in Croatia from 1995 to 2003. *Diabetes Res Clin Pract.*;80(1):122–7).
- [2]. **Arafa N, Amin G. (2010)**: The Epidemiology of Diabetes Mellitus in Egypt. *Egyptian Journal of Community Medicine*; 28(3):34-45)
- [3]. **Wild S, Roglic G, Green A, Sicree R, King H. (2004)**: Global Prevalence of Diabetes. Estimates for the year 2000 and projections for 2030. *Diabetes Care*; 5: 1047-1053).
- [4]. **Bangstad H, Danne T, Deeb L (2007)**: International Society for Pediatric and Adolescent Diabetes (ISPAD). Insulin treatment. ISPAD clinical practice consensus guidelines 2006-2007. *Pediatr. Diabetes.*;8(2):88–102).
- [5]. **Peyrot M, Rubin R, Lauritzen T (2005)**: Resistance to insulin therapy among patients and providers. *Diabetes Care.*;28:2673-2679).
- [6]. **Sarah K. Lyons Ingrid M. Libman N(2013)**: Diabetes in the Adolescent: Transitional Issues *The Journal of Clinical Endocrinology & Metabolism*, Volume 98, Issue 12, 1 December, Pages 4639–4645, <https://doi.org/10.1210.2013-1111>
- [7]. **Martha M, Tammy L, Belinda P, Linda B, Gwen M, Brian J, Mark P, John D, Diane R, Linda M, Katie W and Michael A.(2011)**:National Standards for Diabetes Self-Management Education *Diabetes Care Jan*; 34 (Supplement 1): S89-S96).
- [8]. **Comeaux S and Jaser S (2010)**: Autonomy and insulin in adolescents with type 1 diabetes. *Pediatr Diabetes.*11(7): 498–504).
- [9]. **Garvey K and Laffel L (2015)**: Developmental changes in the roles of patients and families in type 1 diabetes management. *Curr Diabetes Rev* ; American Diabetes Association, 1701 N. Beauregard St., Alexandria, VA 22311. E-mail: nclark@diabetes.org11:231–238
- [10]. **Singh M &SoodA(2016)**: Effectiveness of Video Assisted Teaching Regarding Knowledge and Practice of Intra-Venous Cannulation for Under-five Children. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 5 Ver. VII, PP 10-15 www.iosrjournals.org. DOI: 10.9790/1959-0505071015 www.iosrjournals.org 10 | Page
- [11]. **Majra J &Acharya D(2009)**:Awareness regarding self-care among diabetics in Rural India, *Middle East journal of family medicine.* 7 (6); 25 – 26.
- [12]. **Patton S, Eder S, Schwab J, Sisson C(2010)**: Survey of insulin site rotation in youth with type 1 diabetes mellitus. *J Pediatr Health Care.*;24: 365-371) (Global Attitudes of Patients and Physicians in Insulin Therapy (GAPP) Survey. Data on file and 20% of patients intentionally skip their doses
- [13]. **Peyrot M, Rubin R, Kruger D, Travis L(2010)**:Correlates of insulin injection omission. *Diabetes Care.*; 33: 240-245).
- [14]. **American Association of Diabetes Educators (AADE) (2004)**: Insulin injection assessment tools: <https://www.diabeteseducator.org/practice/educator-tools/insulin-injection-resources2>.
- [15]. **Demirbilek H, Ozbek M, Baran R (2013)**: Incidence of type 1 diabetes mellitus in Turkish children from the southeastern region of the country: a regional report. *J Clin Res Pediatr Endocrinol.*;5: 98–103.
- [16]. **DIAMOND Project Group (2006)**: Incidence and trends of childhood Type 1 diabetes worldwide 1990-1999. *Diabet Med.*;23:857–866.
- [17]. **Streisand R, Respass D, Overstreet S (2002)**: Brief Report: Self-care behaviors of children with type 1 diabetes living in Puerto Rico. *J PediatrPsychol* 27: 759–64
- [18]. **Karnataka D, Berg C,Wiebe J(2013)**: The role of autonomy and pubertal status in understanding age differences in maternal involvement in diabetes responsibility across adolescence. *J PediatrPsychol* 29: 35–46
- [19]. **Ali Z (2010)**: Health and Knowledge Progress among Diabetic Patients after Implementation of a Nursing Care Program Based on Their Profile. *J Diabetes Metabolism.*, 2:121.
- [20]. **El-Ziny M, Salem N, El-Hawary A, Chalaby N and Elsharkaw A (2014)**: Epidemiology of Childhood Type 1 Diabetes Mellitus in Nile Delta, Northern Egypt. *J Clin Res PediatrEndocrinol* 6(1);:9-15
- [21]. **Mahdi H, Hassan Y, Aziz N (2013)**: Diabetes knowledge and practice in Malaysian and the United Arab Emirates diabetic patients. *Research Journal of Pharmaceutical, Biological and Chemical Sciences.* 4(3): 653-665.
- [22]. **Gerensea H, Moges A, Shumiye B, Abrha F, Yesuf M, Birihan T, Birhanu T and Getahun Z (2015)**: Knowledge and Attitude on Insulin Self-Administration Among Type One Diabetic Patients in MekeleHospital, Tigray, Ethiopia. *Advances in Surgical Sciences.* Vol 3, Issue 5, 32-36.
- [23]. **Birkebaek N, Solvig J, Hansen B (2008)**:A 4-mm needle reduces the risk of intramuscular injections without increasing backflow to skin surface in lean diabetic children and adults. *Diabetic Care.*; 31(9): 65.
- [24]. **Ramzy H (2016)**: Effectiveness of nursing intervention regarding self-insulin administration among diabetic patients. *Clinical Nursing Studies.* Vol. 4, No. 2:57-66.
- [25]. **Schilling L, Knalf K, Grey M (2006)**: Changing patterns of self-management in youth with type I diabetes. *J PediatrNurs* 21: 412–24
- [26]. **Swift P (2007)**: ISPAD clinical practice consensus guidelines 2006-2007. *Diabetes education.* *Pediatr Diabetes* 8:103–9
- [27]. **Velasco-Whetsell M, Coffin DA, Lizardo LM et al (2000)**: *Pediatric Nursing.* McGraw-Hill, New York

- [28]. **Al-Banna D and Khuder S (2015):** Effectiveness of the Education Program on Diabetic Patients' Knowledge and Practice Regarding Self-Administration of Insulin in Erbil City. *Kufa Journal for Nursing Sciences.*, Vol.5 No.3: 33-42
- [29]. **Ekim A and Pek H (2010):** Insulin administration skills of children with type 1 diabetes. *Journal of Diabetes Nursing* Vol 14 No 2:70-74
- [30]. **Berhe K, Gebru H, Kahsay H, Kahsay A (2014):** Assessment of Diabetes Knowledge and its Associated Factors among Type 2 Diabetic Patients in Mekelle and Ayder Referral Hospitals, Ethiopia. *J Diabetes Metabolism*, 5:378.
- [31]. **Parecatty T (2013):** Effectiveness of individual planned teaching on self-administration of insulin for patients with diabetes mellitus, receiving insulin in selected hospital management. Msc Thesis. University Of Health Sciences. URL: <http://hdl.handle.net/123456789/3290>.