Assessment of the Primary School Teachers' Knowledge, Attitude and Practice on Care of Children with Type 1 Diabetes at School in Taif Region, Saudi Arabia 2018

Bassam A Alzaidi[1,*], Dr. Ali Mubarak[2], Alaa M Alwagdani[1], Naif A Alzahrani[1], Mohammed Abdulkarim Mohammed Alshehri[3], Hatim Ahmed M Alkhudaydi[3], Abdulelah Abdulrahman A[4]

[1]R4 Family Medicine Resident, Prince Mansour military hospital, Taif, Saudi Arabian
[2]Family medicine consultant, Medical Director of PMMH, Taif, Saudi Arabian
[3]General Practitioner, Armed Force Hospitals - Taif region, Prince Sultan Hospital, Saudi Arabian
[4] 4th Year Medical Student at Taif University, Saudi Arabian
*Corresponding author: b.a.s.99@hotmail.com

Abstract **Background**: Diabetes is a disorder of metabolism where the hormone insulin is deficient, ineffective or absent, resulting in abnormally high blood glucose levels and significant damage to the body's vascular system . The prevalence of type 1 diabetes for Unites States residents aged 0-19 years is 1.7 per 1000. Saudi Arabia is ranked the 7th globally in number of children with T1DM and the 5th regarding the incidence. The prevalence of type 1 diabetes mellitus in Saudi Arabian children and adolescents is 109.5 per 100,000. Diabetes mellitus (DM) is one of the most common chronic childhood diseases. Type 1 diabetes mellitus (T1DM) is the most common autoimmune endocrine disorder in childhood and adolescence1 with increasing incidence worldwide that varies according to race, country, and region. In the last decades, several studies reported a significant increase in T1DM cases in children up to 14 years old. **Aim of the study:** This study aimed to assess diabetes-related knowledge, attitudes and management practices among school teachers in order to determine their diabetes training needs and preparedness to provide adequate care for students with diabetes. **Method:** A cross sectional descriptive study was conducted at Taif primary schools teachers working in governmental schools in Saudi Arabia, in 2018. The researcher invited 411 teachers Systematic random by proportional allocated stratified technique to participate in the study. **Results:** Out of 411 teachers invited to participate in the study, returned completed questionnaire with a response rate of 100%. Their almost of the teachers (28.0%) were in the age group 45-50 years. All of them were males teachers (100.0%), the main source of information about DM cited by teachers was the mass media (67.9%) and Attitude of the teacher toward diabetes mellitus in the school children these study results show that is a significant relation between score and Attitude Negative where (93.2) where P-value=0.001. **Conclusion**: The results reveal that teachers have inadequate knowledge of some of the basic facts of diabetes and its treatment, a situation, which could have dangerous consequences for the child and complicate his or her schooling in a number of ways.coordinating these studies with the schools provided a way to reach a large number of teachers with a message for to prevent diabetes without singling any students out.

Keywords: assessment, primary school, teachers', knowledge, attitude, practice, children type 1 diabetes, school, Taif, Saudi Arabia

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1. Introduction

1.1. Background

Diabetes mellitus (DM) is certain of the most widely diagnosed recognized childhood illness. [1] For children, state funded schools are significant areas for auxiliary avoidance mediations to assist them with limiting their hazard for complications related with DM. The worldwide rate of type 1 diabetes in kids underneath 14 years is expanding with an expected by and large yearly increment of around 3%. [2]

Despite the widespread proposals and promotion in regards to fitting consideration for kids with diabetes in the school, lacking diabetes educators' information, principle among diabetes kids. In 2000, diabetes

influenced an expected 171 million individuals around the world; by 2011 this had expanded to more than 366million and numbers are required to surpass 552million by 2030 [1]

The ordinary pervasiveness of DM (type 1) among Saudis is 0.23%, and the general predominance of type 2 is 0.12% between these under the age about 14 years. [3] Medical specialists emphatically accept that the real commonness of DM among kids and teenagers in the Saudi Arabia is a lots greater than up to expectation reported. For kids and young people, government funded schools are significant areas for auxiliary counteraction mediations to assist them with limiting their hazard for confusions related with DM . want for greater adaptability with respect to glucose checking and timing of food, a requirement for better dietary data in regards to cafeteria nourishments, and stress over diabetes crises at school were as yet revealed. [4] School instructors are possibly viable faculty, who could impact the mentality and conduct of younger students by means of their insight. Inside the school they are additionally considered as the principle guardians to these kids. Instructors' consciousness of medical issues could assume a role in mitigating the kid's experiencing diabetes and its inconveniences. [5]

The formative changes that happen as school kids with type 1 diabetes develop into youth require visit revaluation of their restorative needs. Singular contrasts in caloric admission identified with development sprays and cooperation in sports, beginning of menses in female young people, and pre-adult emotional episodes are largely factors that families must consider in overseeing care and empowering self-care by through it youths. [6]

Effective diabetes administration at school has various numerous results. It can promote a healthy learning condition, advance full in all curricular and extra-curricular exercises, accomplish glycemic control, and help guarantee powerful reaction if there should be an occurrence of diabetes-related crisis and better scholarly accomplishment. (5, 6) There are two forms of type 1 diabetes:

- Idiopathic type 1. This refers to rare forms of the disease with no known cause.
- Immune-mediated diabetes. An autoimmune disorder in which the body's immune system destroys. [8]

The natural procedure changes that happen as school-age adolescents with type 1 diabetes develop into youthfulness require visit evaluation of their remedial wants. Singular varieties in caloric admission related with development sprays and interest in sports, beginning of removing in ladylike young people, and juvenile emotional episodes are on the whole factors that families ought to think about in overseeing care and empowering self-care by these adolescents. Must by a compromise demonstration between the amount of food ate up, practice taken, and insulin infused to keep up a protected glucose level. This will be inconvenient for adolescents, children and their families to deal with that is the reason support from school laborers is hence important. [9]

Review of literature

The worldwide occurrence of type 1 diabetes in youngsters beneath 14 years is expanding with an expected by and large yearly increment of around 3%. [8] subsequently, diabetes instruction must be focused toward instructors, and other school staff to assist them with being in control of applicable administration and relational abilities for giving a few components of direction and guiding identifying with understudies with DM when essential. [10]

In Minnesota, Hayes-Bohn et al. (2004) performed qualitative research in conformity with concerns, and suggestions in regards to the consideration of youngsters with T1DM in schools. Members detailed that they were most worried that school work force, especially study hall instructors, had lacking information on diabetes. Participants additionally mentioned that junk food was also was excessively effectively available. [11]

It was likewise discovered that kids who could self-regulate were bound to get insulin at school (93%), contrasted with the individuals who required help (65%). Guest instructors and educators additionally regulated insulin all the more utilizing insulin siphons (26% guest instructor, 30% educator) contrasted with infusions (6% guest instructor, 12% instructor). The greater part (81%) of kids got insulin in the study hall, and the rest of in the school organization office. There were little differences dependent on topographical area announced, with kids living in little and enormous metropolitan zones almost certain (83%) to get insulin contrasted with those living in country (67%) and semi-rustic (71%) regions. [12]

Schwartz et al. (2010) overviewed 80 children and youths with diabetes, their family or guardians, and school faculty who thought about kids and teenagers with diabetes. Just 20% of the school medical caretakers studied felt that they were satisfactorily prepared to help understudies with hypoglycemia. In addition 65% of school staff announced they were worried about obligation gives that could be related with inappropriately thinking about understudies with diabetes. [13]

Abdel Gawwad (2008) conducts study to evaluate diabetes-related information, perspectives and the executives rehearses among teachers so as to decide their diabetes preparing necessities and readiness to give sufficient consideration to understudies with diabetes. A cross sectional illustrative investigation was completed among 177 teachers in Boys and Girls essential and moderate school mixes in Riyadh City. [14]

The outcomes demonstrated that the majority of the teachers had reasonable diabetes information (78%), and unfavorable perspectives toward assuming liability of diabetes instruction and care in schools. Perceiving ordinary, low and high glucose levels was the least known. The most continuous wellsprings of data were booklets, pamphlets, broad communications and own understanding. A negative significant relationship was found among information and disposition scores. Just 18.6% of instructors had got great complete score of diabetes the rehearses for their diabetic understudies. [14]

Moreover, the investigation additionally demonstrated that there might be disparities in insulin treatment adequacy in schools relying upon the topographical area of kids, so kids (and guardians) in less created territories may possibly profit by expanded data and information about diabetes use and treatments. [12] Study featured the need of diabetes instruction instructional classes particularly

intended to teachers to advance sufficient consideration and the board of diabetes crises in schools. [14]

Instructors' information and perspectives towards T1DM are of vital significance when managing T1DM in schools. T1DM in youngsters is in all likelihood seen in middle and secondary younger students. At times children don't get legitimate help because of absence of teachers' information about their condition. [15]

This study showed that even schools in developed countries, for example, the USA experience issues as far as guaranteeing that educators are prepared and learned in the treatment of kids with diabetes. This features the likely need to accurately adjust handy issues identifying with non-restoratively prepared school work force, and school approaches in regards to the arrangement of help for kids with diabetes in schools.

1.2. Rationale

T1DM is a life-long disorder which can be treated by a complex regimen of insulin injections, diet and exercise, and which greatly affects the life of patients and their families. This is particularly the case for children and adolescents with diabetes who may struggle to cope with the management of diabetes within the school environment. Children and adolescents may find it difficult to find medical and social support at school from teachers, staff, and other students. Consequently, this study will add significantly to the limited knowledge about the care and treatment of T1DM among school children. It will also significantly add to the limited knowledge regarding knowledge and attitudes of teachers to children with T1DM. It is envisaged that the findings from this research may provide a rationale for formulation of school health policies that will be targeted towards the effective management of T1DM within the Saudi school environment.

1.3. Aim of the Study

To assess diabetes-related knowledge, attitudes and management practices among school teachers in order to determine their diabetes training needs and preparedness to provide adequate care for students with diabetes.

1.4. Specific Objective

- To identify their knowledge, attitudes and management practices among school teachers.
- To investigate medical and social children's needs and at school from teachers, staff, and other students at school.
- To determine teacher's diabetes training needs and preparedness to provide adequate care for students with diabetes.

2. Methodology

2.1. Study Area

This study has been conducted at Taif primary schools in 2018. The study was conducted in Taif governorate, in the western region of Saudi Arabia. It is located in the Makkah Province at an elevation of 1700-2500 meters above sea level. The city population is 1,200,000 and it reflects a diversified demographic profile with a considerable portion of the population comes from rural descent, while others come from an urban one. [16] This difference translates into biological, socioeconomic and lifestyle differences in the Taif population.

2.2. Study Population

The target populations are school teachers who working in Boys schools in Taif City during the period of study and accepted the invitation to participate in the study.

2.3. Study Design

This study is a cross sectional descriptive study

2.4. Inclusion Criteria

School teachers affiliated to the chosen schools during the time of study with any teaching specialty who agrees to participate in the study.

2.5. Exclusion Criteria

No specific exclusion criteria.

2.6. Sample Size

Estimated population about 5000 and by using EPI info version 7, the estimated study sample size has been (411) was carried out including representative sample of Arabic-speaker primary school teachers working in governmental schools in Taif, Saudi Arabia, 2018, who are present at the time of the study and willing to participate in it.

2.7. Sampling Technique

Systematic random sampling technique is adopted the male teachers for boys` governmental schools. Teachers represented all grades. This followed by using a numbered list of teachers` names in all selected schools through online random number generator software. [13]

2.8. Data Collection Tool

A Self-administered validated and reliable Arabic questionnaire has been be utilized. It is composed of three main parts Questionnaire:

Part 1 Included general information on demographic of the target population which includes age, gender and nationality.

The second part Includes 13 Multiple Choices questions assessing the teacher's knowledge.

The third part it includes 24 statements (3 points Likert scale) assessing the teacher's practices.

The forth part It includes 24 statements (3 points Likert scale). This measure elicited their attitude toward diabetic students, should they treated the same as other peers, views about teachers and family responsibility to take care for these students, their role in educating

students about DM, their readiness to manage DM emergencies and their willingness to receive training about diabetes.

2.9. Data Collection Technique

After obtaining necessary approvals they explained the objectives of the research in an easy language to the participants.

Self-administered questionnaires were distributed on selected the teachers and collected after 30 mint. The data collection was implemented at regular day working hours during the break and free class time according to each teacher in teachers room over one month period. Each questionnaire took 20 to 30 minutes to be filled.

2.10. Data Entry and Analysis

The statistical package for social sciences (SPSS) software version 23 had been used for data entry and analysis. Significance was determined at p value < 0.05. Continuous variables were presented as means and standard deviation while categorical variables were presented as frequencies and percentages. Bivariate analysis of mean percentage of knowledge subscale scores with regard to independent variables was done by unpaired t test and one-way analysis of variance (ANOVA) statistical tests.

2.11. Pilot Study

A pilot study was conducted in a randomly selected primary school to test if questionnaire is understandable and acceptable. After achieving its aims, the collected questionnaires from this center were omitted from the main study.

2.12. Ethical Considerations

Written permissions from Program of Family and Community Medicine and Ministry of Education were obtained before conducting the research. Permission of all primary school directors and teachers who participated in the study were obtained. The researcher tried his best not to disturb the primary schools; he visited all the schools after arranging with the schools directors. The individual consent from each teacher to participate in the study was a prerequisite for data collection. It was written on front page of questionnaire that (Answering questionnaire means agreement of participation in the study).

2.13. Relevance and Expectations

- There may be significantly high prevalence of T1DM among children and adolescents at school.
- To know the difficult to find medical and social support at school from teachers, staff, and other students to the children and adolescents It will also significantly add to the limited knowledge regarding knowledge and attitudes of teachers to children with T1DM. It is envisaged that the

findings from this research may provide a rationale for formulation of school health policies that will be targeted towards the effective management of T1DM within the Saudi school environment.

2.14. Expected Study Limitation

- We expect to meet a situation where some participants may not be so willing to respond fully to the questionnaire's items, jeopardizing the study's response rate, and hence the results' generalizability. On our part, we will first explain to participants the importance of the study, clarify to them the exact questionnaire aim and contents, in order to remove their worries and assure confidentiality. Such action may well enhance their responses to the questionnaire's encompassed questions.
- Short time and limited resources.

2.15. Budget

Self-funded.

3. Results

Out of (411) teachers invited to participate in the study, the completed questionnaire with a response rate of (100.0%).

Table 1. Distribution of demographic data(age, gender, social, job years, income, sources of information about DM) in our study(n=411)

	N	%
Age		
<35	54	13.1
35-40	81	19.7
40-45	96	23.4
45-50	115	28.0
>50	65	15.8
Gender		
Male	411	100.0
social		
Married	411	100.0
Job years		
<10	18	4.4
10-20.	192	46.7
20-30.	180	43.8
>30	21	5.1
Income		
<5000	271	65.9
5000-15000	55	13.4
>15000	85	20.7
The main sources of information about DM cited by teachers		
Booklets and brochures	116	28.2
Mass media	279	67.9
Own personal experience	158	38.4
Educational films	53	12.9
others	33	8.0

Table 1 shows that almost of the teachers (28.0%) were in the age group 45-50 years, all of them were males (100.0%), also all of them were married (100.0%),the job years of experience ranged between 10-20 years of them (46.7%) while they were job experience between 20-40years in(43.8%) of them.

Table 2. Description of the assessment of teacher's knowledge

Items	True		False		Not sure		Chi-square	
	N	%	N	%	N	%	X^2	P-value
DM leads to polyuria in diabetic patients	393	95.6	8	1.9	10	2.4	717.562	<0.001*
DM leads to polydepsia in diabetic patients	370	90.0	7	1.7	34	8.3	597.066	<0.001*
DM leads to fatigue and lack of concentration in diabetic patients	369	89.8	7	1.7	35	8.5	592.175	<0.001*
DM leads to loss of weight in diabetic patients	356	86.6	26	6.3	29	7.1	525.153	<0.001*
Type I DM is treated with insulin	194	47.2	123	29.9	94	22.9	38.642	<0.001*
Tremors and sweating means hypoglycemia in diabetic students	318	77.4	21	5.1	72	17.5	368.190	<0.001*
The diabetic student should take sweats or juices before physical activity class	224	54.5	74	18.0	113	27.5	88.423	<0.001*
Glucose is essential for the brain to function	239	58.2	21	5.1	151	36.7	175.591	<0.001*

Table 2 the testing tool included 8 objective questions (assessment of teacher's knowledge, about signs and symptoms). The questions had answers true, false, not sure. These questions were analyzed using percentage, Chi square analysis and P-value.

Show that is a significant relation in assessment of teacher's knowledge, about signs and symptoms(DM leads to polyuria in diabetic patients, DM leads to polydepsia in diabetic patients, DM leads to fatigue and lack of concentration in diabetic patients, DM leads to loss of weight in diabetic patients, Type I DM is treated with insulin, Tremors and sweating means hypoglycemia in diabetic students, The diabetic student should take sweats or juices before physical activity class, Glucose is essential for the brain to function) respectively(increase in true answer than not sure or false), where respectively X^2=(717.562, 597.066, 592.175, 525.153, 38.642, 368.190, 88.423, 175.591), and P-value=0.001.

The testing tool included 4 objective questions (assessment of teacher's knowledge, about signs and symptoms in the school child with diabetes). The questions had answers multiple choices. These questions were analyzed using percentage, Chi square analysis.

Table 3 show that is a significant relation between the items of knowledge (A major concern for the school child with diabetes is the likelihood of developing, A sign of high glucose in a child with diabetes may be, Glucagon is) and correct answer where (decrease in the percentage of correct answer), where percentage respectively(6.6%, 45.5%, 15.6%) where X^2=(521.786, 126.995, 299.238) and P-value=0.001.

While that a significant relation between the items of knowledge in the general rule for treatment of low blood glucose is and correct answer where correct answer percentage (61.1%, X^2= 310.041 and P-value=0.001).

Table 3. Description Complete assessment of teacher's knowledge

Items			Chi-square	
	N	%	X^2	P-value
A major concern for the school child with diabetes is the likelihood of developing				
High blood glucose problems	53	12.9		
Infections	2	0.5		
Low blood glucose problems	27	6.6	521.786	<0.001*
Both a and c	262	63.7		
Not sure	67	16.3		
A sign of high glucose in a child with diabetes may be				
Feeling shaky	95	23.1		
Having to go to the bathroom frequently	187	45.5	126.995	<0.001*
Irritability	26	6.3		
Not sure	103	25.1		
A general rule for treatment of low blood glucose is				
Call the child's physician	66	16.1		
Give some form of glucose as quickly as possible	251	61.1	310.041	<0.001*
Make sure the child is given more insulin	13	3.2		
Not sure	81	19.7		
Glucagon is				
A hormone that lowers blood glucose levels	51	12.4		
A medication that mimics insulin	42	10.2	299.238	<0.001*
A hormone that raises blood glucose levels	64	15.6		
Not sure	254	61.8		

Table 4. Description of the assessment of teacher practices

Items	practices						Chi-square	
	Done		Not done		Not applicable		X^2	P-value
	N	%	N	%	N	%		
1 Trying to have competency in using glucometer	296	72.0%	12	2.9%	103	25.1%	307.022	<0.001*
2 Allowing student to use restroom more than once at class time	375	91.2%	6	1.5%	30	7.3%	622.292	<0.001*
Permission for the student to perform self-injection of insulin in the class	162	39.4%	69	16.8%	180	43.8%	51.810	<0.001*
Helping diabetic student in making decisions	352	85.6%	11	2.7%	48	11.7%	511.109	<0.001*
Trying to have competency in insulin injection	244	59.4%	26	6.3%	141	34.3%	173.620	<0.001*
Discussing parents about student's condition at the beginning of school year	327	79.6%	10	2.4%	74	18.0%	410.204	<0.001*
Preventing diabetic student from eating sweet at school	195	47.4%	46	11.2%	170	41.4%	92.949	<0.001*
Permission for the student to eat his meal and snack anywhere, including the classroom	347	84.4%	4	1.0%	60	14.6%	494.292	<0.001*
Asking school administration to provide food and drinks for student all the school day	202	49.1%	36	8.8%	173	42.1%	114.759	<0.001*
Talking about DM with diabetic student and all classmates	278	67.6%	10	2.4%	123	29.9%	264.277	<0.001*
Getting emergencies help immediately if diabetic student loses his consciousness	383	93.2%	2	0.5%	26	6.3%	664.686	<0.001*
Making a list for diabetic student medications & times of administration while in school	195	47.4%	13	3.2%	203	49.4%	168.584	<0.001*
Knowing meal &snacks schedule and remind the student to take snack at time	187	45.5%	14	3.4%	210	51.1%	167.577	<0.001*
Permission for the student to see the school nurse or other trained school personnel upon request	311	75.7%	21	5.1%	79	19.2%	343.766	<0.001*
Allowing student to have free access to fluids (i,e. water) as necessary	373	90.8%	7	1.7%	31	7.5%	611.912	<0.001*
Keeping some types of sugar in class to treat hypoglycemic reaction	209	50.9%	15	3.6%	187	45.5%	164.730	<0.001*
Asking parent to provide the school with glucometer, medications&Snacks	135	32.8%	41	10.0%	235	57.2%	137.401	<0.001*
Developing an emergency action plan	239	58.2%	10	2.4%	162	39.4%	198.234	<0.001*
Observe diabetic student all the school day	241	58.6%	20	4.9%	150	36.5%	180.102	<0.001*

The testing tool included 19 objective questions (assessment of teacher's practices With the school child with diabetes) . The questions had answers Done, Not done, Not applicable. These questions were analyzed using percentage, Chi square analysis.

Table 4 show that is a significant relation between the items of teacher practices and answer while (increase in the percentage of Done answer), where percentage respectively) (72.0%, 91.2%, 75.7 90.8%, 50.9%, 32.8%, 58.2%, 58.6%) where $X^2=$ (307.022, 622.292, 511.109, 173.620, 410.204, 92.949, 494.292, 114.759, 264.277, 664.686, 168.584, 167.577, 343.766, 611.912, 164.730, 137.401, 198.234, 180.102) and P-value=0.001. While that is a significant relation between the item of Permission for the student to perform self-injection of insulin in the class and Not applicable answer where answer percentage (43.8%, $X^2=$ 51.810 and P-value=0.001).

The testing tool included 10 objective questions (the assessment of teacher's attitude). The questions had answers Agree, Neutral, Disagree. These questions were analyzed using percentage, Chi square analysis.

Table 5 show that is a significant relation between the items of teacher's attitude and answer while (increase in the percentage of Disagree), where percentage respectively (75.4%, 81.5%, 84.7%, 89.8%, 46.2%, 73.2%, 84.4%, 90.3%) where $X^2=$ (328.307, 438.365, 495.518, 591.781, 224.533, 303.606, 488.117, 600.978) and P-value=0.001.

While that is a significant relation between the item of students with DM pretend ill to win their sympathy and Neutral answer where answer percentage (46.5%, $X^2=$ 32.161 and P-value=0.001).

Table 5. Description of the assessment of teacher's attitude

	Attitude						Chi-square	
	Agree		Neutral		Disagree		X^2	P-value
	N	%	N	%	N	%		
diabetic student shouldn't be treated the same as other peers as they deserve special attention	44	10.7%	57	13.9%	310	75.4%	328.307	<0.001*
students with DM pretend ill to win their sympathy	114	27.7%	191	46.5%	106	25.8%	32.161	<0.001*
providing diabetes care to a student is not their responsibility but a family responsibility	176	42.8%	114	27.7%	121	29.4%	16.832	<0.001*
teachers' have a role in gathering information updating their knowledge about DM	13	3.2%	63	15.3%	335	81.5%	438.365	<0.001*
teachers should educating students about DM and its prevention	8	1.9%	55	13.4%	348	84.7%	495.518	<0.001*
teachers should counseling and advising diabetic student	8	1.9%	34	8.3%	369	89.8%	591.781	<0.001*
I confident in own abilities to manage DM	61	14.8%	160	38.9%	190	46.2%	224.533	<0.001*
I'm ready to attend training about DM care	30	7.3%	80	19.5%	301	73.2%	303.606	<0.001*
Are you willing to have diabetic children in your class?	13	3.2%	51	12.4%	347	84.4%	488.117	<0.001*
Do you support presence of school nurse?	10	2.4%	30	7.3%	371	90.3%	600.978	<0.001*

Table 6. Distribution of the knowledge, practices, attitude of teacher regarding diabetes mellitus in the school child

Items		N	%	Score		Chi-square	
				Range	Mean±SD	X^2	P-value
Knowledge	**Weak**	71	17.3	2-13.	8.669±2.178	48.628	<0.001*
	Average	178	43.3				
	High	162	39.4				
Practices	**Weak**	118	28.7	2-19.	11.927±3.835	15.810	<0.001*
	Average	175	42.6				
	High	118	28.7				
Attitude	**Negative**	383	93.2	0-18	4.075±2.679	306.630	<0.001*
	Positive	28	6.8				

Regarding knowledge of the teacher toward diabetes mellitus in the school children these study results show that is a significant relation between score and knowledge (increase in average where (43.3) than high and weak), where X^2 (248.628) and P-value=0.001 and the data ranged from (2 to 13) by mean +SD (8.669±2.178). Regarding Practices of the teacher toward diabetes mellitus in the school children these study results show that is a significant relation between score and Practices (increase in average where(42.6) than high and weak), where X^2 (15.810) and P-value=0.001 and the data ranged from (2 to 19) by mean +SD (11.927±3.835). Regarding Attitude of the teacher toward diabetes mellitus in the school children these study results show that is a significant relation between score and Attitude (increase in Negative where (93.2) than Positive), where X^2 (306.630) and P-value=0.001 and the data ranged from (0 to 18) by mean +SD (4.075±2.679).

Table 7 show that is a significant relation between knowledge and demographic data regarding age (increase in >50), where f=4.475 and P-value=0.002 by mean+ SD (9.338 ± 1.939). A significant relation between knowledge and age. Regarding job years show that is a significant relation between knowledge and job years (increase in >30 working years), where f=3.931 and P-value=0.009 by mean+ SD (9.333±2.058). A significant relation between knowledge and job years. Regarding the practices show that is no significant relation between practices and demographic data. Regarding the Attitude show, that is no significant relation between Attitude and demographic data.
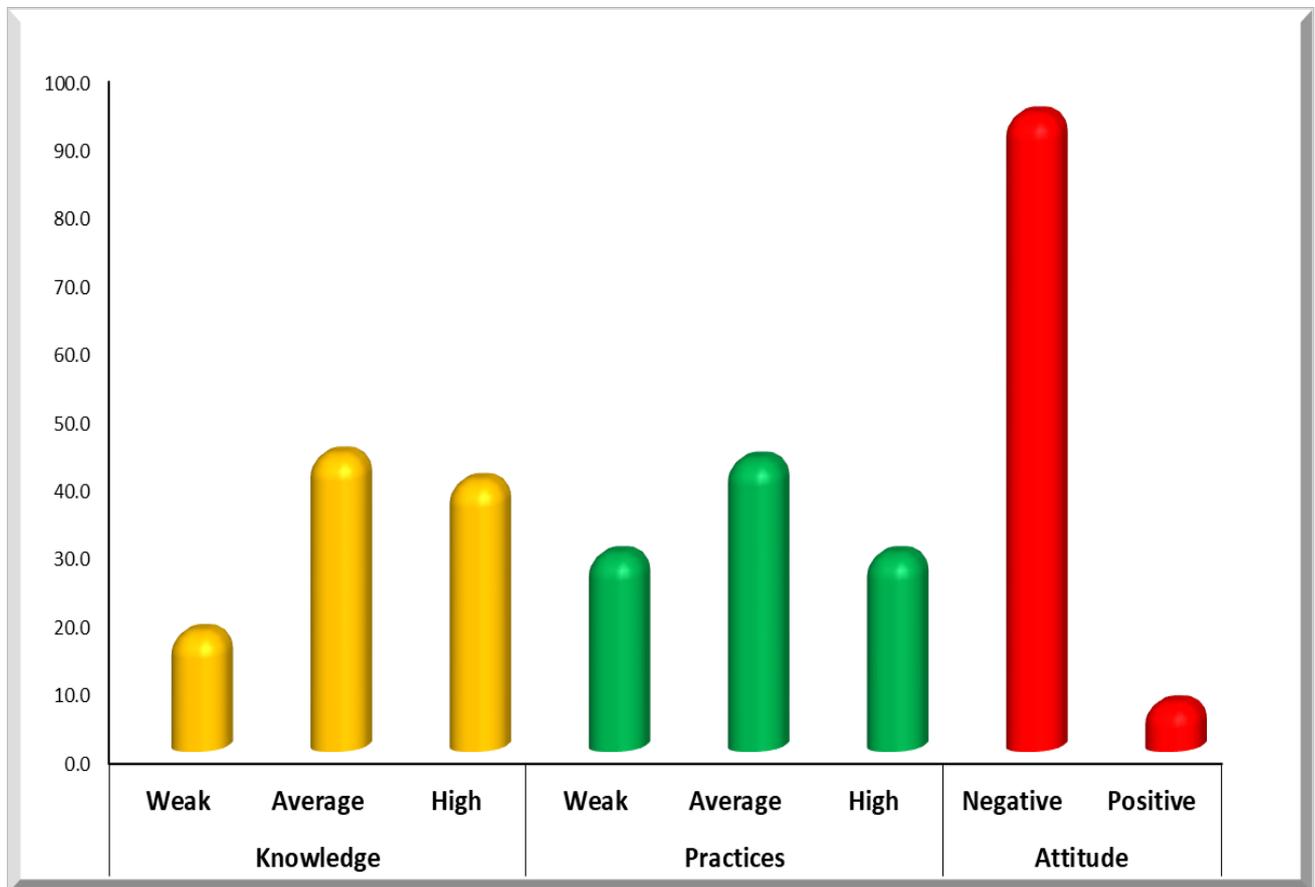

Figure 1. Distribution of the knowledge, practices, attitude of teacher regarding diabetes mellitus in the schoolchild

Table 7. Distribution of the knowledge, practices, attitude in the demographic data(age, job years and income) of teacher toward knowledge of diabetes mellitus in the school child

| Items			N	Knowledge			ANOVA test	
				Mean	±	SD	F	P-value
Knowledge	Age	<35	54	8.370	±	1.762	4.475	0.002*
		35-40	81	8.012	±	2.194		
		40-45	96	8.552	±	2.280		
		45-50	115	8.991	±	2.254		
		>50	65	9.338	±	1.939		
	job years	<10	18	8.056	±	1.955	3.931	0.009*
		10-20.	192	8.349	±	2.177		
		20-30.	180	8.994	±	2.160		
		>30	21	9.333	±	2.058		
	Income	<5000	271	8.638	±	2.162	2.238	0.108
		5000-15000	55	8.255	±	2.351		
		>15000	85	9.035	±	2.079		
Practices	Age	<35	54	12.907	±	3.482	1.337	0.256
		35-40	81	11.815	±	3.860		
		40-45	96	11.885	±	3.682		
		45-50	115	11.478	±	4.020		
		>50	65	12.108	±	3.926		
	job years	<10	18	13.944	±	2.388	2.236	0.084
		10-20.	192	12.016	±	3.818		
		20-30.	180	11.733	±	3.974		
		>30	21	11.048	±	3.339		
	Income	<5000	271	12.070	±	3.711	1.489	0.227
		5000-15000	55	12.200	±	4.052		
		>15000	85	11.294	±	4.056		
Attitude	Age	<35	54	4.130	±	2.518	1.187	0.316
		35-40	81	4.296	±	2.930		
		40-45	96	3.563	±	2.321		
		45-50	115	4.209	±	2.716		
		>50	65	4.277	±	2.891		
	job years	<10	18	3.889	±	3.909	0.076	0.973
		10-20.	192	4.052	±	2.543		
		20-30.	180	4.133	±	2.751		
		>30	21	3.952	±	2.156		
	Income	<5000	271	4.188	±	2.738	1.899	0.151
		5000-15000	55	4.291	±	3.095		
		>15000	85	3.576	±	2.118		
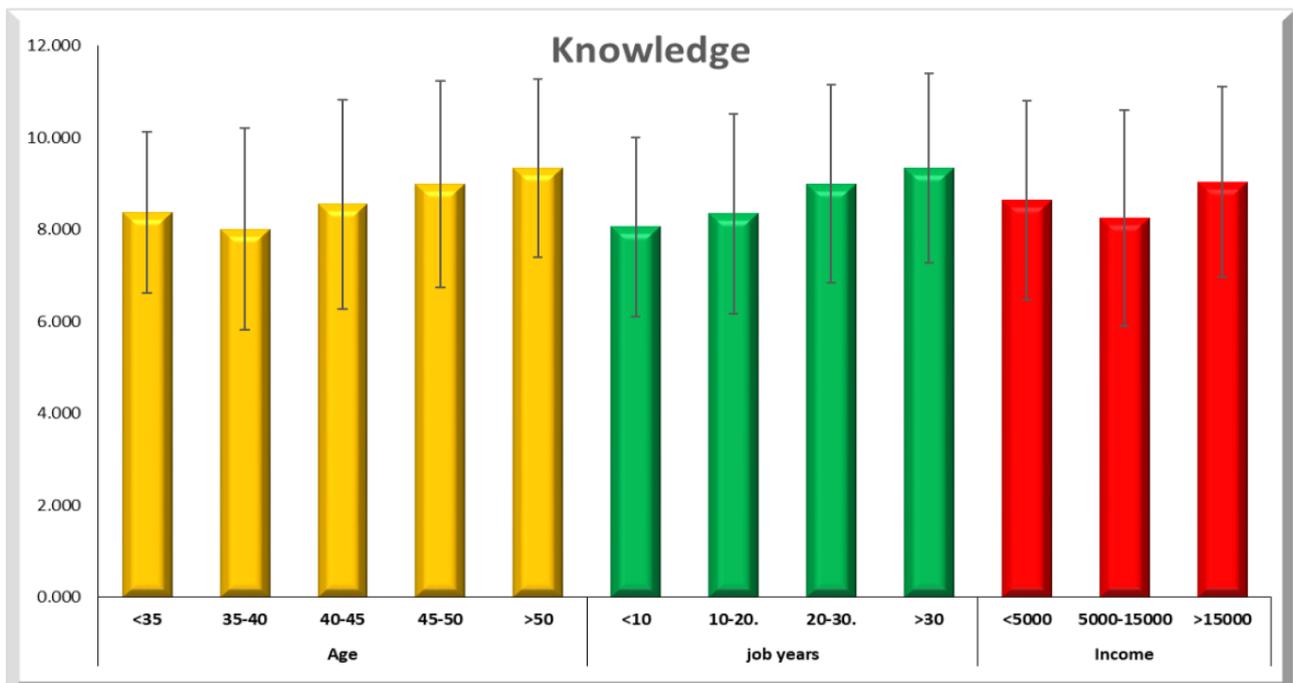
Figure 2. Distribution of the knowledge in the demographic data (age, job years and income) of teacher toward knowledge of diabetes mellitus in the schoolchild
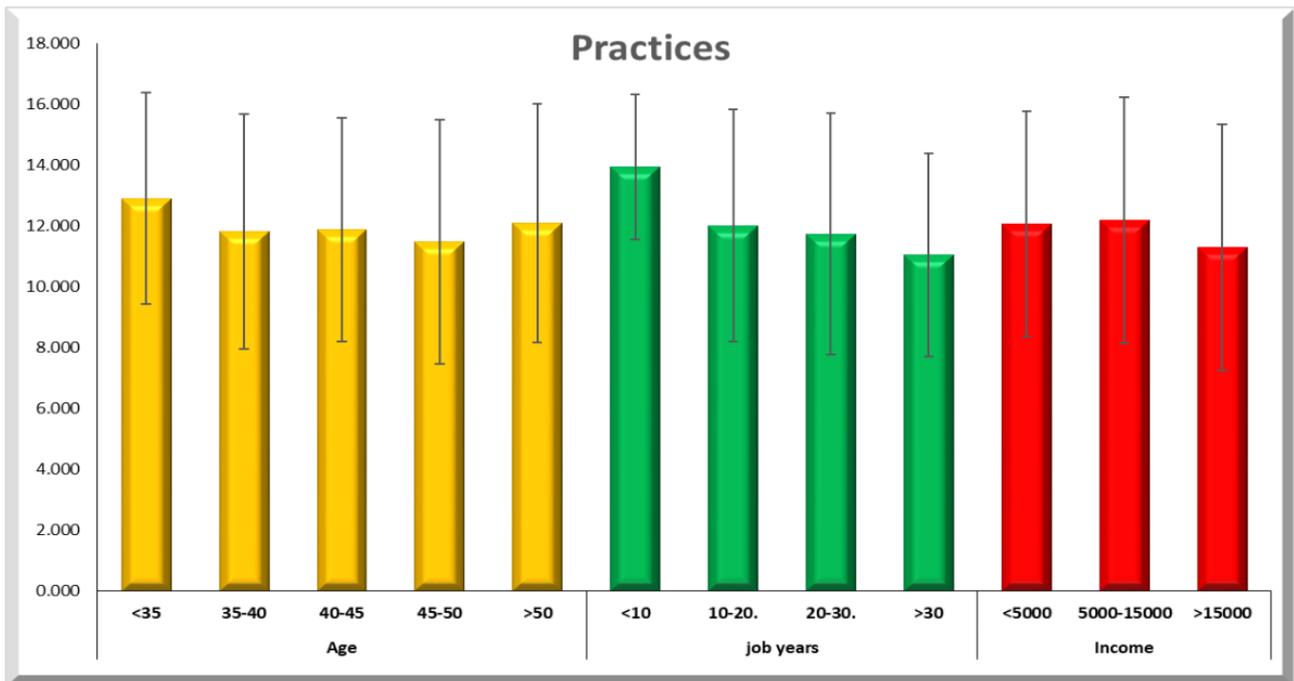
Figure 3. Distribution of the practices in the demographic data (age, job years and income) of teacher toward knowledge of diabetes mellitus in the school child
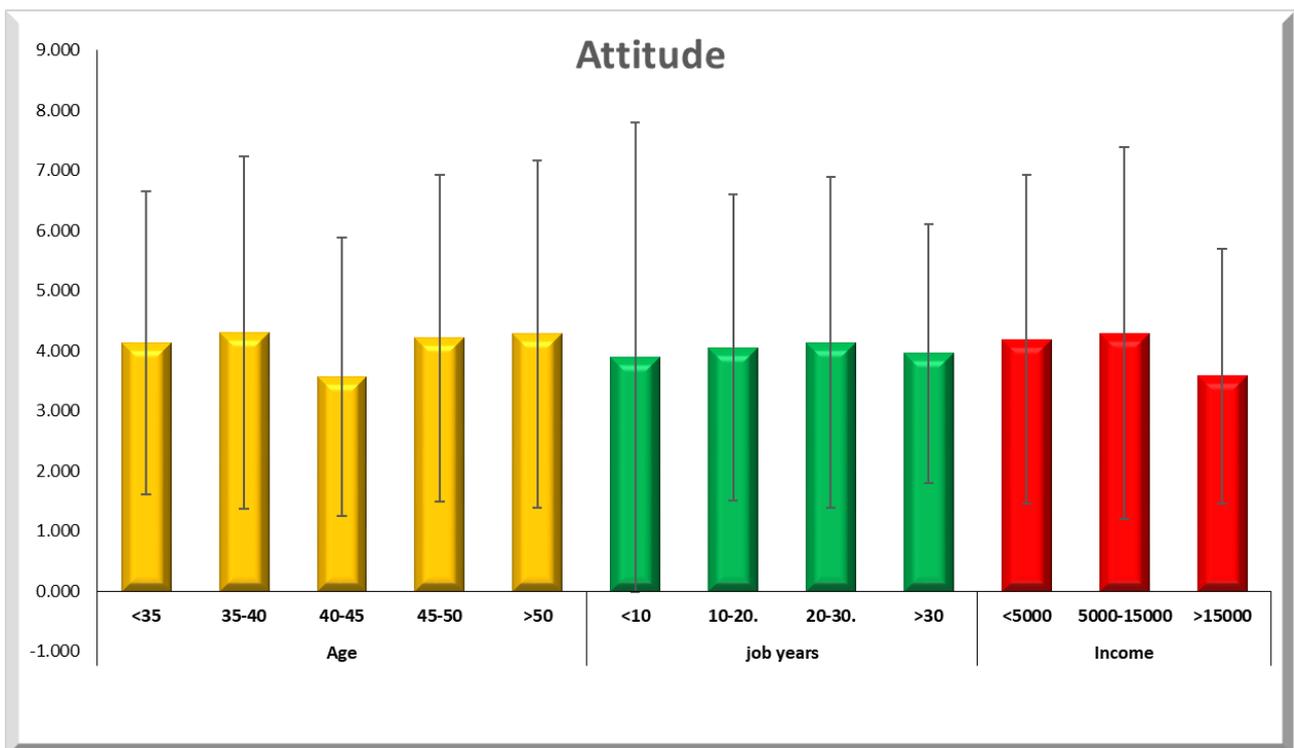

Figure 4. Distribution of the attitude in the demographic data (age, job years and income) of teacher toward knowledge of diabetes mellitus in the school child

4. Discussion

Overall, the data collected and analyzed indicate an decrease and lack in knowledge in teachers' in primary schools participating in study focused on knowledge, attitude and practice on care of children with Type 1 Diabetes at school in Taif region, Saudi Arabia 2018. Children with diabetes type 1 (T1DM) need close monitoring for their blood glucose, food intake, insulin therapy and physical activity during school hours in order

to guard. In our study the majority of our participants were almost of the teachers (28.0%) were in the age group 45-50 years In the current study, Mass media was the main source of information about type 1 DM were (67.9%) followed by Own personal experience, Booklets and brochures such sources are well known to raise awareness and increase knowledge about health issues but seldom changing attitudes, behavior or teach practical skills. There was no role for healthcare providers in educating teachers. (See Table 1) Similarly, IDF Diabetes

Atlas (20082) Mass media was the main source of information could be a useful source of health information for teachers but that they themselves would have to possess adequate and accurate knowledge of health issues. [17]

Although for some questions the correct responses increase in teacher's knowledge about signs and symptoms and show that is a significant relation between the items of knowledge and correct answer the majority of questions had answers (true)were P-value=0.001. (See Table 2). In our study the majority of our participants were noticed that lack of teacher's knowledge about signs and symptoms and show that is a significant relation between the items of knowledge and correct answer where (decrease in the percentage of correct answer), where percentage respectively (6.6%, 45.5%, 15.6%) where X2=(521.786, 126.995, 299.238) and P-value=0.001. (See Table 3, 6) Similarly, Alnasir and Skerman (2004) [18] also found lack of knowledge and attitudes among Bahraini schoolteachers. In Riyadh, a study conducted among primary and intermediate school compounds in Riyadh City showed that 78% of them had got fair total knowledge level.19 Similar results were found in the studies of Lewis et al. (2003) [19] and Melton & Henderson (2007) [20] where about 17% of schools did not have a staff member with knowledge about diabetes. In our study the majority of our participants were almost of the teachers show that is a significant relation between the items of teacher practices and answer while increase in the percentage of Done answer, where percentage respectively) (72.0%,91.2%, 75.7 90.8%, 50.9%, 32.8%, 58.2%, 58.6% and P-value=0.001. While that is a significant relation between the item of Permission for the student to perform self-injection of insulin in the class and Not applicable answer where answer percentage (43.8%, X^2= 51.810 and P-value=0.001). (See Table 4 and Table 5) This is similar to what has been reported in Riyadh, where health care providers played insignificant role in educating teachers about DM. [12] Teachers should understand the nature of DM, its complications and how to ensure the safety of the diabetic students. Studies have shown that public school teachers' knowledge, practices, attitude of teacher regarding diabetes mellitus in the school child .of diabetes is lacking. [22] (19) Consistently, the results of the present study highlight inadequate diabetes-related knowledge, practices, attitude(Average and Weak)among the studied sample where (60.6%) of them had got insufficient total knowledge level. Warne (2005) also found that, only one third of the primary school teachers were found to have an adequate overall knowledge of diabetes. [23] In Al-Khobar, Saudi Arabia, Abahussain and El-Zubier (2005) reported lack of understanding of nature of diabetes and knowledge about symptoms of hypoglycemia among female diabetic school teachers and (25%) of them was using certain herbs for the treatment of their DM. (See Table 6, Table 7). Studies have shown that public school teachers' knowledge, practices, attitude of teacher regarding diabetes mellitus in the schoolchild .of diabetes is lacking. [24] Consistently, the results of the present study highlight inadequate diabetes-related knowledge, practices, attitude (Average and Weak) among the studied sample where (60.6%) of them had insufficient total knowledge level.

Teachers' knowledge, attitude and practice are usually a reflection of their knowledge, beliefs and perceptions. School teachers therefore, should have proper attitudes and be knowledgeable with regards to health issues in order to provide good care. Unexpectedly, the present findings delineate a significant negative relationship between knowledge and knowledge, attitude and practice among teachers. Studies have shown teachers over >50 years were more knowledge than the younger. The last finding could be explained by the fact that those teachers undertake the responsibility of keeping their family members healthy; hence they should be more aware about common health problems. a significant relation between knowledge and age and job years and No significant relation between knowledge and income .A significant relation between knowledge and job years . No significant relation between knowledge and income. Also no significant relation between Practices, Attitude and age, job years and income. (See Table 7)

5. Conclusion

In conclusion, the study highlights the Assessment of the primary school teachers' knowledge, attitude and practice on care of children with Type 1 Diabetes at school among teachers, practices and attitude provided to students with diabetes in schools. Unfavorable attitudes toward taking responsibility of diabetes care and education was prevalent. Therefore the study recommends the need for effective practical in-service and training programs for the primary school teachers' in each school about diabetes care procedures and management of emergencies. Further research is needed to explore a broad array of factors that motivate teachers and build their self-efficacy to carry out diabetes care in schools.

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