Knowledge, attitudes and practices of school teachers regarding acute complications of type 1 diabetes mellitus in Abha city, southwestern Saudi Arabia

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Abstract

Background: Type 1 diabetes mellitus (T1DM) is one of the most frequent chronic disorders of childhood. Teachers' awareness regarding diabetes and its complications, besides emergency care of their diabetic children, can save their lives.

Aim: To assess knowledge, attitude and practice of school teachers regarding T1DM and its acute complications.

Methodology: A descriptive cross-sectional survey was conducted in the schools of Abha city. Data were collected using self-administered questionnaires distributed to all participants. Data collected covered teachers' socio-demographic data, work related data including work years and educational level. Teachers' awareness, practice and attitude twowardsT1DM were included in the questionnaire.

Results: The present study included 499 teachers. With regards to teachers' awareness regarding T12DM among students, 91.2% of the teachers mentioned that T1DM leads to polyuria in diabetic students, 89.6% reported that DM leads to polydipsia, and 77.6% said that tremors and sweating means hypoglycaemia in a diabetic student. The study showed that 63.5% of the teachers had good general awareness level regarding T1DM. As for their awareness regarding consequences, 90.4% of the teachers reported that in case of hypoglycaemia, the diabetic student should take sweet juice. About 95% of the teachers reported that they support T1DM students in their classes and 47.1% mentioned that their schools appointed someone to look after T1DM children.

Conclusions & recommendations: The present study documented a good level of knowledge, practice and positive attitude of school teachers towards T1DM students. It is suggested to increase the role of schools by establishing educational and training programs for teachers, especially teachers who showed their willingness to join such programs. More trained personnel should be present in schools to deal with T1DM students.

Key words: T1DM, teachers, awareness, knowledge, practice, attitude, complications

Background

Type 1 diabetes mellitus (T1DM) is considered one of the most common chronic diseases of childhood (1). It is an autoimmune disease which may be diagnosed at any age (2). It accounts for only about 5 to 10% of all cases of diabetes. However, worldwide T1DM increases (3). The immune system of the body destroys the Beta cells of the Pancreas which affect the production of insulin (2). T1DM is more common in males (4). T1DM incidence may vary with seasonal changes and also with the birth month. More cases were diagnosed in autumn and winter (5). People are born in the spring to have a higher chance of T1DM (6). T1DM is considered to have an immune-association. If T1DM is not directly immune-mediated, it causes the destruction of insulin-producing pancreatic β cells (7, 8). It was considered a disorder in children and adolescents, but over the past decade, this opinion has changed. Polydipsia, polyphagia, and polyuria are commonly known as the classic trio of symptoms which are associated with the disease onset (9). Over the past decade, the technological improvements in insulin pumps and the continuous glucose monitors can help patients with T1DM to manage the challenge of lifelong insulin administration (10). T1DM complications are all related to poor blood glucose control. To manage the symptoms and prevent further damage, controlling blood glucose levels is a must (11). Hypoglycaemia, diabetic ketoacidosis (DKA) and severe hypoglycaemia are the major acute complications of T1DM (12).

Teachers' awareness regarding T1DM, its complications and emergency care of their diabetic children can save their lives. This can be achieved through assessing teachers' awareness level, to detect gaps and manage through periodic training programs and health education sessions. The current research objectives were to study school teachers' awareness regarding T1DM, its acute complications and emergency management.

Methodology

A descriptive cross-sectional survey was conducted in the schools of Abha city, Aseer region during the period from late November 2018 through to February 2019. The study targeted teachers from different schools. Two-stage stratified cluster random sampling technique was performed. Schools were stratified into kindergarten, primary, intermediate or secondary. In the first stage, within each stratum, 5 schools were randomly chosen. In the second stage, all accessible teachers in the selected schools were invited to participate after explaining the study purpose and assuring that their data will be confidential. After having permission from the school authority, self-administered questionnaires were distributed to all participants with explanations about the questionnaire by the investigator and class teacher. Then, questionnaires filled in by teachers were collected at the school after 30 minutes. The study questionnaire was developed by the researcher after intensive literature review and after experts' consultation for tool validity and clarity. Response rate exceeded 95%. Incomplete questionnaires were not included. Data collected covered teachers' socio-demographic data, work related data including work years, educational level, teachers' awareness regarding diabetes mellitus including general awareness data (7 questions) and diabetes consequences awareness (6 questions). The last part included school practice and teacher behaviour and attitude towards diabetic students.

Data analysis

Data were extracted, revised, coded and fed into statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed test. P value less than or equal to 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A teacher with score less than 60% of the maximum score was considered to have poor awareness while good awareness was considered if they had score of 60% of the maximum or more. Descriptive analysis based on frequency and percent distribution was done for all variables including teachers' demographic data, awareness items and practice and attitude. Cross tabulation was used to assess distribution of awareness according to teachers' personal data, practice and attitude. Relations were tested using Pearson chi-square test.

Results

The present study included 499 teachers. Their age ranged from 20 to 60 years with an average of 40 ± 7.3 years. The study showed that 67.1% of the teachers were females and 85.8% had Bachelor's degree while 6.8% had postgraduate master or doctorate degrees. About 65% of the teachers had teaching experience of 10 years or more and 46.3% worked at primary schools (Table 1).

With regards to teachers' awareness regarding T1DM among students (Table 2), 91.2% of the teachers mentioned that T1DM leads to polyuria in a diabetic student, 89.6% reported that T1DM leads to polydipsia, and 77.6% said that tremors and sweating means hypoglycaemia in a diabetic student. The study showed that 63.5% of the teachers had good general awareness level regarding diabetes mellitus. As for their awareness regarding T1DM consequences, 90.4% of the teachers reported that in the case of hypoglycaemia, the T1DM student should take sweet juice, 79.4% reported that T1DM children were eligible to attend the physical education session, while 49.1% agreed that T1DM affects the student's academic performance. Generally speaking, 58.5% of teachers had good awareness level regarding consequences of T1DM while overall good awareness regarding diabetes among teachers amounted to 68.3%.

Figure 1 illustrates teachers and schools' practices towards T1DM students. About 95% of the teachers reported that they support diabetic students in their classes, 47.1% mentioned that their schools appointed someone to look after diabetic children, and 25.8% reported having a

training program for dealing with diabetic children while 15.2% mentioned that their schools provide special meals for diabetic students.

Considering teachers' attitude (Table 3), 99.4% of the teachers supported presence of a school nurse, 80.2% stated that they would like to join a training program for dealing with diabetic students, and 78% were willing to have diabetic children in their class.

Table 4 illustrates distribution of teachers' awareness by their background data. All teachers who had doctorate degree had good awareness level regarding diabetes mellitus among students compared to 66.4% of those with Bachelor's degree. This difference was statistically significant (P=0.048). Also, 71.2% of the teachers with teaching experience exceeding 10 years had good awareness level compared to 63% of those whose experience is less than 10 years with recorded statistical significance (P=0.049). Exactly 75.4% of teachers whose school has a training program for dealing with diabetic students had good awareness level compared to 65.5% of those who did not (P=0.034). Also, 71% of the teachers who would like to join a training program for dealing with diabetic students had good awareness level compared to others who would not (P=0.012).

Table 1.:Personal data of survey teachers in Abha, Saudi Arabia

Personal data		No	%
Age in years	20-29	48	9.6%
	30-39	163	32.7%
	40-49	240	48.1%
	50-60	48	9.6%
Gender	Male	164	32.9%
	Female	335	67.1%
Educational level	Bachelor's degree	428	85.8%
	Diploma	37	7.4%
	Master degree	32	6.4%
	Doctorate degree	2	.4%
Years of experience	<10 years	173	34.7%
	>10 years	326	65.3%
Education sector	Kindergarten school	76	15.2%
	Primary school	231	46.3%
	Intermediate school	88	17.6%
	Secondary school	104	20.8%

Table 2: Teachers' awareness regarding diabetes among their school students in Abha, Saudi Arabia

Domain	Awareness items	Yes		No		Don't know	
		No	%	No	%	No	%
General Awareness	DM leads to polyuria in diabetic student	455	91.2%	11	2.2%	33	6.6%
	DM leads polydipsia in diabetic student	447	89.6%	19	3.8%	33	6.6%
	DM leads to fatigue and lack of concentration in diabetic student	362	72.5%	44	8.8%	93	18.6%
	DM leads to loss of weight in diabetic student	297	59.5%	73	14.6%	129	25.9%
	Type 1 DM is treated with insulin	264	52.9%	88	17.6%	147	29.5%
	Tremors and sweating means hypoglycaemia in diabetic student	387	77.6%	20	4.0%	92	18.4%
	The diabetic student should take sweets or juice before physical activities class	205	41.1%	129	25.9%	165	33.1%
	Total awareness		Poor		Good		
			182 (36.5%)		317 (63.5%)		
Diabetic consequences awareness	School children are usually affected by type 1 DM	221	44.3%	81	16.2%	197	39.5%
	DM affects the student academic performance	245	49.1%	161	32.3%	93	18.6%
	DM increases absence rate of diabetic student	281	56.3%	138	27.7%	80	16.0%
	Diabetic children eligible to attend the physical education session	396	79.4%	29	5.8%	74	14.8%
	In case of hypoglycaemia, should the diabetic student take sweet juice	451	90.4%	19	3.8%	29	5.8%
	In case of coma, can small amount of jam or honey be put into the mouth of the diabetic student	269	53.9%	72	14.4%	158	31.7%
	Total awareness		Poor		Good		
			207 (41.5%)		292 (58.5%)		
Overall awareness			Poor		Good		
			158 (31.7%)		341 (68.3%)		

Figure 1. Teachers and school practice towards diabetic students in Abha, Saudi Arabia

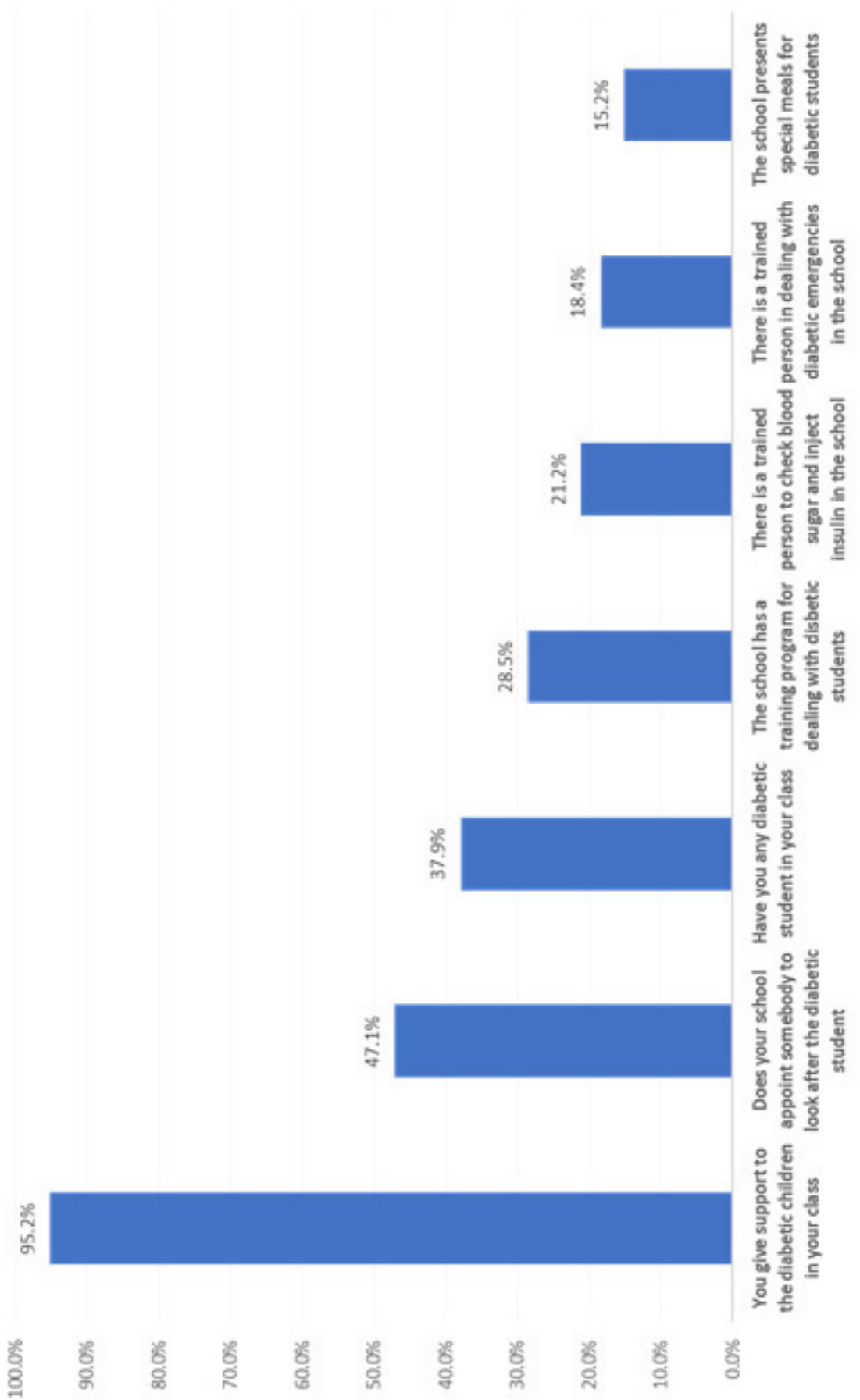

Table 3: Teachers' attitude towards diabetic students in Abha, Saudi Arabia

Attitude	Yes		No		Unsure	
	No	%	No	%	no	%
Willing to have diabetic children in your class	389	78.0%	60	12.0%	50	10.0%
Would you like to join training program for dealing with diabetic student	400	80.2%	57	11.4%	42	8.4%
Support presence of school nurse	496	99.4%	2	.4%	1	.2%

Table 4: Distribution of teachers' awareness level regarding diabetes among students according to their personal data, practice and attitude

		Overall awareness level				p-value
		Poor		Good		
		No	%	No	%	
Age in years	20-29	19	39.6%	29	60.4%	.538
	30-39	54	33.1%	109	66.9%	
	40-49	71	29.6%	169	70.4%	
	50-60	14	29.2%	34	70.8%	
Gender	Male	60	36.6%	104	63.4%	.098
	Female	98	29.3%	237	70.7%	
Educational level	Bachelor's degree	144	33.6%	284	66.4%	.048*
	Diploma	10	27.0%	27	73.0%	
	Master degree	4	12.5%	28	87.5%	
	Doctorate degree	0	0.0%	2	100.0%	
Years of experience	<10 years	64	37.0%	109	63.0%	.049*
	>10 years	94	28.8%	232	71.2%	
Have you any diabetic students in your class	Yes	59	31.2%	130	68.8%	.867
	No	99	31.9%	211	68.1%	
The school has a training program for dealing with diabetic students	Yes	35	24.6%	107	75.4%	.034*
	No	123	34.5%	234	65.5%	
Would you like to join training program for dealing with diabetic student	Yes	116	29.0%	284	71.0%	.012*
	No	42	42.4%	57	57.6%	

P: Pearson X2 test
* P < 0.05 (significant)

Discussion

Studies in Saudi Arabia showed low level of knowledge and awareness of DM among the Saudi population (13). The present study included 499 teachers; the awareness of teachers was studied regarding general awareness about T1DM and consequences among students. The general awareness of teachers was good among more than half of them (63.5%), only 36.5% had poor general awareness, whereas regarding diabetic complications, a lower percentage of teachers had good awareness 58.5%, whereas 41.5% had poor diabetic complications awareness. The overall awareness of teachers was good among 68.3%. A recent study from Al-Jouf conducted on teachers of primary and intermediate schools, reported that 75.4% of participants had adequate general knowledge, whereas 43.78% only had diabetic specific knowledge (14). Another study from Riyadh revealed that 70% of teachers had fair knowledge (15). On the other hand, a study from Al-Khobar that was conducted on female diabetic school teachers reported that there was low knowledge regarding the symptoms of hypoglycaemia (16). Moderate knowledge was reported from another Saudi study conducted on school teachers (17).

In the present study, educational level of teachers, years of experience, presence of training programs in schools and the willingness of teachers to join training programs significantly affected the level of teachers' awareness. Good awareness was significantly associated with having bachelor degree, teaching experience more than 10 years, no presence of training program in school and this reflects the self-effort of teachers to know about DM and to care for their students. Also, good awareness was associated with the willingness of teachers to join training programs. A recent study from Al-Baha, Saudi Arabia showed that the experience of teachers had a positive impact on the diabetic students (18). In contrast to our findings, another Saudi study reported that age and gender were associated with awareness level of teachers (17).

The practice of teachers in the present study was the highest regarding giving support to the diabetic children in the class (95.2%), followed by presence of someone to look after the diabetic students in school (47.1%). Only 28.5% of teachers reported the presence of a training program for dealing with diabetic students and 21.2% reported the presence of a person to check blood sugar for diabetic students and inject insulin in the school, if necessary. Very few (15.2%) reported the presence of special meals for diabetic students. The above-mentioned results point out that practice of teachers was good, but the practice of schools should be improved by providing periodical educational and training programs about DM and its complications and how to deal with diabetic students. In one Saudi study only 16% of teachers reported presence of training programs in schools (14). Low practice was reported by another Saudi study, where only 18.6% of teachers had a good total score of Diabetes practice management (15).

Regarding attitude of teachers in the present study, it was found to be positive and excellent. The majority of teachers (78%) were willing to have diabetic children in their class, 80.2% agreed to join training programs and 99.4% supported the presence of school nurses to deal with diabetic students. Our findings were in agreement with a the previous Saudi study in Al Jouf, where 94% of teachers were willing to join training programs, and the majority (66.5%) supported presence of nurses at schools (14). On the other hand a study from Riyadh reported unfavourable attitudes of teachers toward taking responsibility for diabetes care and education in schools (15). This may reflect the need for a national program to deal with this issue.

Conclusion and recommendations

The present study documented good level of knowledge, practice and positive attitude of school teachers towards diabetic students. It is suggested to increase the role of schools by establishing educational and training programs for teachers, especially teachers who showed their willing to join such programs. More trained personnel should be present in schools to deal with diabetic students. Further studies are recommended to clarify in depth this important issue.

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