

**Assessment of knowledge of diabetes mellitus among Bahraini school teachers**

**Faisal A. Latif Alnasir FPC, FRCGP, MICGP, PhD**  
*Associate Professor*  
*Department of Family and Community Medicine*  
*Vice Dean, Student Affairs and Premedical Program*  
*College of Medicine and Medical Sciences*  
*Arabian Gulf University*  
*Consultant Family Physician,*  
*Naim Health Centre*  
*Ministry Of Health*

**Corresponding Author:** Faisal A. Latif Alnasir FPC, FRCGP, MICGP, PhD  
P.O. Box 22979, Manama, Kingdom of Bahrain

E-mail: [faisal@agu.edu.bh](mailto:faisal@agu.edu.bh)

Facsimile: +973 230730

Residence: +973 729408

Mobile: +973 9464048

## **Assessment of diabetic knowledge of the Bahraini school teachers**

### **Abstract**

*Background:* School teachers are potentially effective personal which could influence the attitude and behavior of school children via their knowledge.

Within the school they are also considered as the main care giver to these children. Teachers' awareness of health problem could play a role in alleviating the child's suffering from diabetes and its complications.

*Objective:* To assess the school teachers' knowledge of the clinical presentation and complication of diabetes mellitus among school children.

*Results:* The Study showed that the school teachers in Bahrain are deficient in diabetic knowledge. The mean knowledge score was 5.34. Married teachers, primary school teachers and females teachers had better knowledge than the other teachers. Also knowledge was related to whether the teachers had an experience with illness or adopting a healthy life style.

*Conclusion:* School teachers in Bahrain have inadequate knowledge of the basic facts about diabetes and its treatment, a situation which could have dangerous consequences for the child and complicate its schooling in a number of ways. Since they are considered to be the first line of children protection in school, they ought to be knowledgeable of common health problems in order to offer their help and support to the students when needed.

**Key words:** Diabetes mellitus, school, teachers, students, school teacher, knowledge.

## **Introduction**

Teachers are considered to be the first line of protection for the school children. Apart from parents, school teachers are the main care-givers to these children [1]. Care is provided to this sector of the population mainly by two sources: home and school. Commonwealth governments officially recommended that schools are excellent places in which to promote better health as part of the proposed National Health Strategy. These countries recently endorsed the concept of Health Promoting Schools [2].

Public school teachers represent potential effective first-respondent during disasters and isolated emergencies in the school environment [3]. They must deal not only with health emergencies of normal children, but also with emergencies of children with special health care needs [4].

Knowledge is usually transferred to the children from their teachers either directly through teaching or, which is the most important, indirectly via teacher's attitude and practices. These children see their teachers as role models that they copy imitating their behavior and acquiring their knowledge.

The children and adolescent constitute around 38.9% of the Bahraini population [5]. Therefore, they constitute a major sector of the population.

As in other developing countries, Bahraini children and adolescents face many physical and psychological problems, prominent among which are problems caused by diabetes mellitus.

Diabetes mellitus (DM) is a chronic health problem whose incidence among school children is increasing [1]. The prevalence of DM in Bahrain reaches up to 30% and in a published report the prevalence of type I in children is about 0.3 to 0.4% [6]. Diabetes has a physical and psychological impact on the affected children. Complications mainly due to non-compliance to medication may result into hypoglycemic attacks at school. Such a sequel is distressing to the child, colleagues and teachers and needs swift interference and probably life saving first aid management. Children with diabetes continue to have special health needs at school.

It is likely that teachers will at some point encounter a child with diabetes in the classroom. A study in North Carolina showed that 76% of teachers had taught children with chronic health conditions sometime during their career. New research results indicate a role for teachers in helping to meet the special needs of children with diabetes [8,7].

Studies have shown that teachers have a fundamental lack of understanding of child health issues and generally have a poor level of knowledge about diabetes and its management [1,2]. Another study indicated that only 25% of teachers seemed to have adequate understanding of diabetes and there was little knowledge of recognition and treatment of emergency diabetic problems and aspects of diet [9]. Not only teachers but also most school staff seemed to lack

any source of information about diabetes [10]. Parents of school children are dissatisfied with the school care of their children's diabetes and with teachers' knowledge of diabetes [11].

With this background information in mind this study was carried out aiming at assessing the Bahraini school teachers' knowledge of diabetes mellitus.

## Methods

This study is part of a major national project to assess Bahraini school teachers' knowledge about common health problems. Out of the total number of schools (n=152), 49 schools were randomly selected to be included in the study representing all the schools. A predesigned self-administered questionnaire was distributed to all the 1248 male and female teachers serving in those schools. The questionnaire was collected after one day and teachers who did not respond were reminded twice. Based on literature review and inquiry from a group of doctors, a set of ten statements representing the commonest signs, symptoms or complications of diabetes mellitus of which four were incorrect (from No. 7 to 10) were designed. They are as follows:

Diabetics:

- 1- could present with loss of body weight.
- 2- could complain of tiredness and / or generalized body ache.
- 3- may suffer from delayed healing of wound.
- 4- may complain of diuresis.
- 5- may complain of polydipsia.
- 6- may have decreased sexual abilities.
- 7- body weight would increase as a complication of DM.
- 8- main complaint is loss of appetite.
- 9- main complaint is pain in the joints.
- 10- main complaint is abdominal pain.

The teachers were asked to give their response to these pre-set questions by writing either 'Yes' (agrees), 'No' (do not agree) or 'Do not know' to the answer.

The questionnaire was tested for face value and content validity and later a pilot study was done to test it. A score of one was given to each correct response and zero for wrong or unknown answers. The maximum score that any teacher could obtain if all the responses were correct was 10. Data were analyzed using the SPSS program version 11.5. Cross tabulation and test for chi square was done and a p value of  $<0.05$  was considered significant.

## Results

The response rate was 89% (n=1140). The general characteristics of the non-responders were found to be not different from the sample population. The results showed that 513 (45%) of teachers were from primary schools, 285 (25%) belonged to intermediate and 342 (30%) were secondary school teachers.

Female teachers made up 60% of the sample and higher percentage of them had higher qualifications (81% vs. 70%). All the teachers were within the age range of 20 to 58 years and a mean of 32.7. The majority of the teachers (n=889) were married, a finding that reflects the normal marital pattern in Bahrain. Eighty one percent had a university education, and 19% had completed high school only. They had been teaching between one and 35 years with a mean of 12.3 years. Only 13% had worked for 20 years and more. Regular exercise was practiced by only 18% of the teachers.

One thousand and sixty four teachers (93.3%) responded to the knowledge part of the questionnaire. The diabetic knowledge score that was obtained by the teachers ranged between one and 10 with a mean of 5.34, median 5.5 and Standard Deviation. of 2.13. Table-1 highlights the number of teachers who responded correctly to each of the diabetic statements.

The results showed that there are various variables related to having diabetic knowledge as stated below and shown in Table- 2:

1. The level of knowledge about DM was better in females than males, 89.5% vs. to 76.6%. [P value 0.001 Chi. Sq. 33.927].

2. More Science teachers had diabetic knowledge (89.6%) than Arts teachers (83.6%). [P value 0.05 Chi. Sq. 4.505].
3. Teachers who did not drink alcohol (84.7%) had more diabetic knowledge than alcohol drinkers. [P value 0.002 Chi. Sq. 5.94].
4. Teachers with an ill family member had more diabetic knowledge (88.5%) than those with no family illness (83%). [P value 0.05 Chi. Sq. 5.24].
5. Teachers who had unsatisfactory perception about their general health (92%) had more diabetic knowledge than those with satisfactory views (84%). [P value 0.05 Chi. Sq. 3.897]

## **Discussion**

Diabetes mellitus is a chronic debilitating disease, which is very common in Bahrain. Teachers should be aware of this condition, to understand its nature, complications and how to ensure the safety of the diabetic students. First aid management in case of hypoglycemic attacks could be life saving to the affected child. Therefore teachers should be able to handle such situations. However, studies have shown that many teachers had no specific training in first-aid and 40% never had been trained in CPR [3], for example, a study has shown that most of the English public school teachers were deficient in both training and knowledge of emergency care [12].

Our study showed that teachers have average or deficient knowledge about DM (the mean diabetic knowledge score was 5.34). Similar finding was reported by others [1,9-11]. Johnson et al indicated that only 7% of teachers thought that their certification course work of chronic health conditions was adequate [8]. The knowledge of the Bahraini teachers was found to be related to various variables. With regards to gender, knowledge was better among the female teachers and science teachers were more knowledgeable. Teachers who had healthy attitude represented by not indulging in alcohol and smoking had better knowledge. However, because drinking alcohol is forbidden by religion not all who drink alcohol in Bahrain will admit it. Those who had experienced an illness such as having a member of his/her family being ill had better knowledge. The study found that the primary school teachers are more knowledgeable than the others. Reasons for this could be related to the fact that they are younger and have higher qualification. Finally, married teachers were more aware than the singles.

The last finding could be explained by the fact that the married teachers undertake the responsibility of keeping their family members healthy; hence they should be more aware about common health problems.

Only four out of the 10 knowledge statements had a correct response rate of 50% of the teachers. The most common forms of diabetic knowledge were diuresis (86%), delayed wound healing (81%), polydipsia (78%) and tiredness and bodyache (77%). Very few teachers (32%) knew that DM could affect sexual abilities. However there were also teachers who had wrong diabetic concepts and understanding such as 51% thought that the main presenting symptom of DM is joint pain.

Knowledgeable teachers have the ability of developing the diabetic child's intrinsic motivation towards diabetic awareness. One study showed that patients completing a diabetic education program had improved blood glucose control, had greater knowledge ( $p < 0.001$ ) and more favorable attitudes ( $p < 0.03$ ) [13]. Such favorable health attitudes could be developed and enhanced in school children. Another study reported that both school staff and parents were of the opinion that diabetic pupils need special consideration at school [10]. In addition, teachers in an English study thought that health education programs should contribute to the total curriculum and said that their role mainly opted for the inclusion of health education in all subjects [12].

Since the prevalence of childhood diabetes is low, while it is high in the adult population [6], it may indicate that certain factors other than genetic factors play a major role in its apparent increment such as environmental factors, personal attitude and life style. Hence school teachers, if adequately prepared with proper training and knowledge could help in influencing changes in the diabetic children's life style and

promote healthy living in all children. This would participate in limiting DM among population.

Usually diabetic children find difficulty in being compliant with the management regimen. Non-compliance is an important factor hindering good control of diabetics [14]. The treatment of juvenile diabetes may also become difficult to manage [10]. This could be the reason of inadequate treatment of childhood diabetes worldwide as shown by recent multicenter studies, even those performed in developed countries without financial restriction [15]. Knowing the fact that treatment is just one element of management, which includes health education, prevention, and promotion of healthy style of living, teachers could have a pivotal role in reinforcing other aspects of management. Better communication and dissemination of information between the specialist, health visitors, school nurses and teachers are required and usually teachers are ready and willing to spend extra time teaching their chronically ill students [1]. All teachers believe and expect that they should know details about the student's chronic condition [16]. In general successful diabetic control in children depends mainly on the quality and intensity of diabetes education [15].

## **Conclusion**

The results reveal that teachers have inadequate knowledge 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.

Continuous in-service health education programs should be implemented in order to update the teachers with knowledge about the prevailing health problems among the children. Ultimately such programs will enable them to be ready to offer help to their students whenever it is needed and improved information of school staff on the subject is recommended.

**Table 1. The school teachers' diabetic knowledge.**

Knowledge (Symptoms/Signs/ Complications)		Rate and No. Of Responses	Percentage of teachers with knowledge			Non- responders
			Correct* responses	Incorrect* responses	Don't know*	
True	<b>Loss of body weight</b>	961	499 (51.9%)	34.2%	13.9%	179 (15.7%)
	<b>Generalized tiredness</b>	969	816 (84.2%)	6.2%	9.6%	171 (15%)
	<b>Delayed wound healing</b>	1015	856 (84.3%)	7.1%	8.6%	125 (10.9%)
	<b>Diuresis</b>	1033	919 (88.9%)	3.8%	7.3%	107 (9.4%)
	<b>Polydipsia</b>	1008	832 (82.6%)	5.9%	11.5%	132 (11.6%)
	<b>Impotence</b>	926	344 (37.2%)	12.5%	50.3%	214 (18.8%)
False	<b>Increase body weight</b>	932	369(39.6%)	44.1%	16.3%	208 (18.3%)
	<b>Anorexia</b>	904	450 (49.8%)	25.1%	25.1%	236 (20.7%)
	<b>Joint Pain</b>	928	226 (24.3%)	51.3%	24.5%	212 (18.6%)
	<b>Abdominal</b>	890	384 (43%)	10.6%	46.4%	250 (21.9%)

\* All the percentages were derived from the total number of those who responded.

**Table 2. Relationship of correct diabetic knowledge to various variables**

	Signs and symptoms	Loss of body weight	Generalized tiredness	Delayed wound healing	Diuresis	Polydipsia	Impotence	No Increase body weight	No Anorexia	No Joint Pain	No Abdominal pain
Variables											
Sex	Men	35%		65%	73%	63%	37%	25%	34%	21%	28%
	Women	50%		82%	86%	80%	26%	38%	43%	20%	38%
	P value	<0.00		<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.02	<0.00
Marital status	Married	50%		73%			32%	41%			33%
	Single	42%		82%			25%	30%			38%
	P value	0.05><0.1		<0.02			0.05><0.1	<0.001			<0.05
Exercise	Yes		74%	77%	83%	76%		38%			
	No		68%	68%	72%	62%		31%			
	P value		0.05><0.1	<0.02	<0.001	<0.001		<0.05			
Duration of occupation in years	1 to 10 years		70%	70%	79%	69%	24%		43%	24%	37%
	11 to 20		76%	81%	84%	78%	36%		38%	18%	33%
	>21 years		64%	74%	80%	77%	37%		35%	16%	28%
	P value		0.05><0.1	<0.01	0.05><0.1	<0.02	<0.001		0.05><0.1	<0.01	0.05><0.1
Type of school	Primary		75%		85%		36%	32%	42%	22%	
	Intermediate		71%		76%		29%	35%	39%	16%	
	Secondary		67%		78%		23%	32%	37%	21%	
	P value		0.05><0.1		<0.01		<0.001	<0.01	<0.02	<0.01	

## References

1. Greenhalgh S.Improving school teachers' knowledge of diabetes. *Prof Nurse*. 1997 Dec;13(3):150-6.
2. Thyer S.The 'Health Promoting Schools' strategy: implications for nursing and allied health professionals. *Collegian*. 1996 Apr;3(2):13-23.
3. Gagliardi M, Neighbors M, Spears C, Byrd S, Snarr J.Emergencies in the school setting: are public school teachers adequately trained to respond? *Prehospital Disaster Med*. 1994 Oct-Dec;9(4):222-5.
4. Barrett LC.Teaching teachers about school health emergencies. *J Sch Nurs*. 2001 Dec;17(6):316-22.
5. Statistical abstract 1995, Central Statistical Organization, Directorate of Statistics. 1996 Bahrain.
6. Al-Mahroos F, McKeigue PM. High prevalence of diabetes in Bahrainis. Associations with ethnicity and raised plasma cholesterol. *Diabetes Care*. 1998 Jun; 21(6): 936.
7. Goodrich SW, McDermott RJ.Changing roles and challenges for teachers of students with diabetes. *J Sch Health*. 1989 Oct;59(8):341-5.
8. Johnson MP, Lubker BB, Fowler MG.Teacher needs assessment for the educational management of children with chronic illnesses. *J Sch Health*. 1988 Aug;58(6):232-5.
9. Bradbury AJ, Smith CS. An assessment of the diabetic knowledge of school teachers. *Arch Dis Child*. 1983 Sep;58(9):692-6.
10. Ludvigsson J. Diabetics in school. Knowledge and attitudes of school staff in relation to juvenile diabetics. *Scand J Soc Med*. 1977;5(1):21-30.
11. Tatman MA, Lessing DN.Can we improve diabetes care in schools? *Arch Dis Child*. 1993 Oct;69(4):450-1.
12. Charlton A.Health education and the teacher's role. *Int J Health Educ*. 1981;24(2):102-12.
13. Lennon GM, Taylor KG, Debney L, Bailey CJ.Knowledge, attitudes, technical competence, and blood glucose control of Type 1 diabetic patients during and after an education programme. *Diabet Med*. 1990 Nov;7(9):825-32.

14. de Villiers FP, Chester E, Meyers KE. Blood glucose control and compliance of diabetic children. *Curationis*. 1997 Jul;20(2):12-6.
15. Dorchy H.-Insulin regimens and insulin adjustments in diabetic children, adolescents and young adults: personal experience. *Diabetes Metab*. 2000 Dec;26(6):500-7.
16. Brook U, Galili A. Knowledge and attitudes of high school teachers towards pupils suffering from chronic diseases. *Patient Educ Couns*. 2001 Apr;43(1):37-42.

