International Journal of Pharmacy Teaching & Practices 2013, Vol.4, Issue 4, 826-831.

Assessment of the knowledge and practice of health care professionals towards diabetes care in Mukalla, Yemen

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Research Article

Please cite this paper as: Salmeen D. Babelgaith[1], Mohd Baidi[2], Saeed Alfadly[3]. Assessment of the knowledge and practice of health care professionals towards diabetes care in Mukalla, Yemen. IJPTP, 2013, 4(4), 826-831.

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Abstract

Objectives: The aim of this study was to evaluate the knowledge and practice of health care professionals(HCPs) towards diabetes care in Mukalla , Yemen .

Methods: The cross sectional study was conducted among health care professionals in Mukalla, Yemen. The diabetes attitudes questionnaire was given directly to 73 health care professionals (Doctors , pharmacists and nurses) in Mukalla , Yemen in 2009. The data were analyzed descriptively and the inferential Kruskal -Wallis test was also used.

Results: Out of those 73, there were 19 pharmacists (26 %), 37 doctors (50.7 %) and 17 (23.3 %) nurses. The result of the current study showed that the majority of the HCPs had a good general knowledge of diabetes and its management. The HCPs' knowledge on the role of diet, foot care and insulin dosing was, however, inadequate.

Conclusion and recommendations

The result of this study found that HCPs has good knowledge on monitoring the sign, symptoms and laboratory parameters. The HCPs' knowledge on the role of diet, foot care and insulin dosing was, however, inadequate. Therefore, HCPs should receive more education programmes regarding diabetes care.

Keywords: *Diabetes mellitus, health care professionals, attitude, Mukalla, Yemen*

Introduction

Diabetes mellitus is a major public health concern and a condition that leads to increased morbidity, mortality, health care utilization and costs.[1,2]. These chronic and serious complications include heart attacks, blindness, kidney failure, stroke and others [3-7]. Therefore, knowledge of the correct methods of diagnosis and proper management of diabetes seems to be indispensable.

All health care professionals, including neurologists, pharmacists, nutritionists, health educators, nurses and other specialists, play significant roles in diabetes management [8]. The improvement noted in patient knowledge on diabetes and its management has been shown to depend on the instructions received from health care professionals [9].

The knowledge of health care professionals toward diabetes could significantly influence the patient outcomes [10-12]. In addition to knowledge updates, the practices of health care professionals toward current concepts about diabetes care are even more critical.

Among all the members of the health care team, staff nurses spend the longest time with the patients. The nurses also serve as the resource person for diabetic patients seeking information on their disease[13]. According to Hjelm *et al*.[14] to promote essential lifestyle changes among diabetic patients, staff nurses need to improve their knowledge of diabetes [14]. Therefore, nurses can provide accurate and up-to-date information to improve health behaviours and outcomes of patients with diabetes [11, 12].

Pharmacists are another essential component of the health care team in the management of diabetes. A pharmacist has a good opportunity to provide diabetes education to patients as they meet patients more often than other professionals. Pharmacists have been reported to meet diabetic patients 5 times more often than other health care professionals to provide antidiabetic drugs, blood testing devices, syringes, insulin and other mediations. Pharmacists could use this opportunity to educate the patients on the proper use of drugs, exercise, diet, monitoring and other information needed by the patients that could improve patient adherence to the management of diabetes. Therefore, the knowledge of pharmacists and their practice towards diabetes could significantly

influence patient outcome. Additionally, pharmacists need to continuously update their knowledge on diabetes and other related topics. Knowledgeable and approachable pharmacists can communicate well with patients and hence, improve the quality of life [10].

Previous studies on the level of health care providers' knowledge on diabetes have shown a great variation in their results. Most studies have found that health care providers have low knowledge on diabetes care. [10, 15-18].

Material and Method

We conducted this cross-sectional study in august 2009 among health care professionals including doctors, nurses and pharmacists from Mukalla city, Hadramout, Yemen. The participants came from various hospitals, clinics and health centres throughout Mukalla city. An ethical approval was obtained from the ministry of health /branch of Hadramout.

The target population for this study included all doctors, pharmacists and nurses listed in Mukalla city. The Health office in Hadramout governorate estimated the total numbers to be 291doctors, 45 pharmacists and 100 nurses. Therefore, the target population for this study was 436. Based on this number, the sample size required to achieve 95% confidence level (RaosoftInc) was 205. The study selected 300 health care professionals using a stratified random selection method. All participants were invited using a special invitation card for cooperation with this study. All participants were briefed on the study, its objectives and the expectations of the researchers; informed verbal consent was presented by all participants.

Diabetes knowledge test

The diabetes knowledge test (DKT) was adapted from Palaian et al. [19]. It composed of 22 multiple choice questions (Appendix D). The questions were validated using 25 subjects and the reliability test Cronbach's alpha = 0.711 after the deletion of 10 questions because of ambiguity. The final questions for the DKT consisted of 12 multiple choice questions.

.All the correct answer for the diabetes knowledge questions was given 1 score. The diabetes knowledge scores was calculated by adding all the correct answer for diabetes knowledge questionnaire and the maximum score was 12.

Knowledge on Goal of Diabetes Management

The questionnaire for the goal of diabetes management was adapted from Ivika Oja [20]. All were Likert scale questions. There were 5 questions that measured the importance. The measurement of importance was very important, important, not important and not important at all.

The knowledge score on the diabetes management, the HCPs ranking on each goal were combined as was given a score for combination of very important and important being "1" whereas the combination of not important and not important at all was given "0". The diabetes management scores was calculated by adding all the correct answer for diabetes management's knowledge questionnaire and the maximum score was 5.

The reliability test showed a Cronbach's Alpha of 0.649 with 5 final questions for the knowledge. The final questions for knowledge on goal of diabetes consisted of 5 multiple choice questions. Although the normality acceptable cut-off point for Cronbach's Alpha is 0.7, the alpha values ranging from 0.5 to 0.6 are considered adequate in exploratory studies [21].

Diabetes practice measurements

The questionnaires for the practice were modified from Ivika Oja [20]. All were 14 Likert scale questions. It composed of 14 questions measured the response and there were with frequency responses were: once a month, once a quarter, at least once a year, less often and not necessary.

The reliability test showed a Cronbach's Alpha of 0.649 with only 8 final questions for the practice. The final questions for the practice consisted of 8 multiple choice questions.

All the correct answer for the diabetes practice questions was given 1 score. The diabetes knowledge scores was calculated by adding all the correct answer for diabetes practice questionnaire and the maximum score was 8.

The data was keyed into the SPSS version 15 for analysis. The descriptive and analytic statistics were used. For descriptive analysis, results were expressed as numbers and percentages.

Results

Response rate

Out of 300 healthcare providers invited for cooperation with this study, only 73 of them turned up. All the 73 healthcare providers (24 %) attended and completed the questionnaire. Out of those 73, there were 19 pharmacists (26 %), 37 doctors (50.7 %) and 17 (23.3 %) nurses.

Distribution of age range of healthcare professionals in sample

Table 1 gives the age of the participants, with the mean age ranging from 30 to 39. About 36.8 % of the pharmacists were aged 40 to 49, the majority of doctors (59.5%) were aged from 30 to 39 and 47.1 % of nurses were between 40 and 49.

Gender of subjects

The majority of the subjects were male (76, 7%); there were 21 females (23.3%), as also shown in Table 1.

Table 1. Distribution of demographic data of health care professional by groups

Age in years	Medical doctors N (%)	Pharmacist N (%)	Nurse N (%)	Cumulative N (%)
20–29	14 (37.8)	5 (26.3)	3 (17.6)	22 (30.1)
30–39	22 (59.5)	5 (26.3)	5 (29.4)	32 (43.8)
40–49	0	7 (36.8)	8 (47.1)	15 (20.5)
50– 59	1 (2.7)	2 (10.5)	1(5.9)	4 (5.5)
Total	37 (50.7)	19 (26.0)	17(23.3)	73 (100)
Gender				
Male	22 (59.5)	18 (94.7)	16 (94.1)	56 (76.7)
Female	15(40.5)	1 (5.3)	1(5.9)	17 (23.3)
Total	37	19	17	73

General knowledge of healthcare providers on diabetes

All 73 participants completed the 12-item multiple choice knowledge test. Table 2 shows the frequency of respondents who gave correct answers. The majority of healthcare professionals (97.3 %) answered correctly whereas 2.7 % of the subjects answered incorrectly regarding the symptoms of diabetes.

The majority of the participants (93.4%) knew that diabetes could increase or worsen the risk of heart attack, stroke, eye problems and kidney problems and 70.8% knew the frequency with which a diabetic patient should measure their blood pressure. About 83.3% of them knew the importance of lifestyle modification for diabetes patients, 94.4% knew about the factors important in controlling blood sugar and 87.5% knew that antibiotics were not a treatment for diabetes. The study discovered however that the percentage of participants who knew about the correct dose of insulin (33.3%), balanced diet (44.4%) and foot care (43.7%) was low.

Knowledge on goal of diabetes management

In this section, healthcare professionals were asked to evaluate selected treatment goals. Healthcare providers were required to state their opinion on the importance of the five listed goals of the management of diabetes. The healthcare professionals had to put a mark against one of the importance levels provided for each statement. The levels ranged from very important to not important at all.

The healthcare providers ranked the importance of each therapy goal as given in Table 3. The majority (74.6%) ranked keeping blood glucose within the normal range as very important and the other goals as important.

Practice

The practice on diabetes management were assessed based on the frequencies of the HCPs monitors or performs the activities considered important in diabetes management. The HCPs were required to indicate the frequencies from monthly, at least once a quarter, at least once a year, less often and not necessary.

Table 2. Response of HCPs (pharmacists, medical doctors and nurse) to knowledge questionnaire N=73

No	Items	Doctors Correct answer N (%)	Pharmacists Correct answer N (%)	Nurses Correct answer N (%)	Total Correct answer N (%)
1	The symptom(s) of diabetes	36 (97.3)	18 (94.7)	17 (100)	71 (97.3)
2	In a diabetic patient, high blood pressure can increase or worsen	34 (94.4)	15 (83.3)	17 (100)	66 (93.0)
3	A diabetic patient should measure his or her blood pressure	25 (69.4)	12 (63.2)	14(82.4)	51 (70.8
4	The lifestyle modification(s) required for diabetic patients Include	31 (83.3)	14 (77.8)	15 (88.2)	60 (83.3)
5	The important factors that help in controlling blood sugar level include	36 (97.3)	17 (94.4)	15 (88.2)	68 (94.4)
6	The well-balanced diet includes	20 (54.1)	5 (27.8)	7 (41.2)	32 (44.4)
7	For proper foot care, a diabetic patient	15 (41.7)	7 (38.9)	9 (52.9)	31 (43.7)
8	Treatment of diabetes comprises	28 (77.8)	13 (76.5)	12 (70.6)	53 (75.5)
9	Diabetes cannot be treated with	33 (89.2)	17 (94.4)	13 (76.5)	63 (87.5)
10	What percentage of the daily insulin requirement does basal insulin generally account for	13 (44.8)	4(26.7)	3 (20.0)	20 (33.9)
11	Diabetic ketoacidosis (DKA) can develop in	19 (54.30	8 (44.4)	10 (62.5)	37 (53.6)
12	Prolonged hyperglycemia can cause	26 (72.2)	15 (78.9)	12 (75.0)	53 (74.6)

As shown in Table 4. The majority of the HCPs monitor the symptoms of complications, blood glucose and blood pressure every visit (note: the frequency of visit is once every month). The monitoring of other parameters such as the lipid profile and renal function tests was done less frequent.

Table 3. HCP's rank on the important of the goal of therapy

Item	Very important N (%)	Important N (%)	Not important N (%)	Not important at all N (%)
Elimination of symptoms	31 (44.3)	32 (45.7)	6 .0 (8.6)	1 (1.4)
Absence of glycosuria	24 (35.3)	30 (44.1)	11 (16.2)	3 (4.4)
keeping blood glucose in normal range	53 (74.6)	17(23.9)	1.0 (1.4)	
Achieving and maintenance of body weight	24 (35.8)	35 (52.2)	6.0 (9.0)	2 (3.0)
Absence of ketonurine	40 (61.5)	17 (26.2)	4.0 (6.2)	3 (6.1)

Table 4. The frequencies of monitoring or intervention given by the HCPs

Item	Once a month N (%)	At least once a quarter N (%)	At least once a year N (%)	Less often N (%)	Not necessary N (%)
Complication /symptoms	36 (62.0)	11 (19)	7 (12.1)	3 (5.2)	1 (1.7)
Blood glucose value	50 (80.6)	10 (16.1)	2 (3.2)		
Blood pressure	37 (62.7)	14 (23.7)	7 (11.9)	1(1.7)	
Lipid profile	9 (16.1)	8 (42.9)	20 (35.7)	3 (5.4)	6 (8.2)
Smoking	11(21.2)	8 (15.4)	13(26.9)	14 (11.5)	6 (11.5)
Proteinuria	16 (27.6)	14 (24.1)	11 (20.7)	5 (19)	(8.6)
Albuminuria	16 (29.1)	14 (25.5)	12 (21.8)	8 (14.5	5 (9.1)
Body weight/ BMI	18 (30.5)	15 (25.4)	13 (22)	10 (16.9)	3 (5.1)

Discussion and Conclusion

Demographic data of health care providers (HCPs)

The response rate of this study was not very good, as only 24% of the HCPs came and completed the questionnaire on diabetes. This rate of response is however comparable to most studies which showed that 20 to 30% of invitees actually turn up [22, 23]. Most of the HCPs were between 30 and 50 years old in Yemen. The majority of the participants (76.7%) representing the HCPs in Mukalla City were male. (Ministry of Health of Yemen / branch Hadramout).

Assessing the general knowledge of health care professionals on diabetes

The result of the current study showed that the majority of the HCPs had a good general knowledge of diabetes and its management. The HCPs' knowledge on the role of diet, foot care and insulin dosing was, however, inadequate. This finding varies between HCPs where doctors score higher knowledge than pharmacist and nurses in diet and insulin dosing, whereas nurses showed higher in foot care. This could be related to their routine duties in diabetes care. The study did not involve dietitians or nutritionists, the two HCPs used to provide dietary advice to diabetic patients. This study could not invite them simply because the two professions were not represented in Mukalla. The finding of this study regarding general knowledge of a well-balanced diet was comparable to the study in Oman in 2007, who found that HCPs' knowledge on diet was about 47% of the total knowledge score [24].

The general knowledge of HCPs on proper foot care was also low (43.7%). In normal practice the pharmacists, nurses and doctors in Yemen do not monitor and advise diabetic patients on foot care except those who already have some foot problems. This finding was also comparable to the recent study conducted among nurses involved in diabetes counseling whose knowledge on diabetes foot care is about 41.4% of the total knowledge score [25].

The other area of weak knowledge among HCPs was on the dosing of insulin 33.9% of this related question. Although this study involved a large number of doctors (50.7%) and pharmacists (26%), who were involved in prescribing and prescription screening, their knowledge on right insulin doses was inadequate. This could lead to medication error or drug misadventure. The finding of this study was

lower than the finding of the study done by Derr *et al*. [18]. Their study found that the knowledge of faculty, interns and nurses was 49%, 62% and 34% of the correct answer respectively.

Assessing the Knowledge on goal of diabetes management of health care

One way to follow the progress of diabetes is by monitoring the signs, symptoms and laboratory parameters. The most important laboratory indicators are glycosuria, blood glucose levels and urinary ketone tests. Additional important parameters, but not frequently monitored in Yemen are HbA1C, lipid profile and urine albumin. In this study, the HCPs ranked the importance of the above parameters in the management of diabetic patients at pre- and post-test.

This study found that the majority of the HCPs rated blood glucose and the absence of ketonuria as very important. This corresponds to the old teaching on the management of diabetes where the maintenance of euglycaemia is very important [26]. The other laboratory parameters were considered as supporting evidence for the development of diabetes complications such as cardiovascular complications and nephropathy. Therefore blood cholesterol and urine albumin were not monitored on a routine basis. Although HbA1C is very important in monitoring the control of diabetes and a good indicator of the patient's compliance with the treatment, it is not commonly monitored in Yemen, probably owing to the unavailability of the device or to the high cost.

In this study, the HCPs rated blood glucose as the most important (74.6 %), followed by absence of ketone urine (61.5 %), elimination of symptoms of diabetes (44.3%) and weight control (35.8%). This finding corresponded to a study by Ivika Oja in 2005 which found that laboratory tests were rated higher than body weight control among doctors [20]. On the other hand, Drass *et al.* [9] reported an opposite result where the HCPs rated absence of ketone bodies in the urine as less important.

Assessment of the HCPs practice on the treatment of diabetes patients

This is important to measure whether the HCPs employ good practice in managing diabetic patients. The assessment was based on the HCPs' frequency of monitoring of the progress of their diabetic patients. The study found that the majority of the HCPs monitored the signs and symptoms of complications, blood glucose and blood pressure of their patients on every visit (monthly). This is in line with most of the diabetic management guidelines which suggest all three parameters should be monitored at every visit [27]. Unlikely, the smoking was not given very serious attention by most of the HCPs, possibly because of the lack of guidelines on smoking cessation in Yemen.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.