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Community Pharmacists' Knowledge, Attitude and Practice Towards Diabetes Care in Tripoli, Libya

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Abstract

Background: Significant benefit from involving community pharmacists in diabetes management has been demonstrated. This study was undertaken to evaluate the knowledge and attitudes of community pharmacists to diabetes care in Tripoli, Libya. **Materials and Methods:** One hundred and forty six conveniently selected community pharmacists were surveyed by 2 questionnaires. The first documented the available services and pharmacists' perceived role in diabetes care. The second evaluated the pharmacists' diabetes knowledge based on a validated 23 item questionnaire, the "Arabic Short Diabetes Knowledge Test" (ASDKT). **Results:** The survey demonstrated inconsistent supply of different diabetic medications. Insulin was not available throughout most of the pharmacies, whereas Sulphonylureas and Metformin were more readily available. Urine and blood glucose testing strips and glucose meters were available irregularly in about half of the pharmacies. The role of pharmacists in diabetes care was mainly viewed as supply and dispensing, dispensing and instruction and help and support. Diabetes educational activities offered by the

pharmacists included providing information on availability of diabetes-related items, counseling on the use of drugs, instruction on use of glucose meters and answering general questions about diabetes. The information provided was rated as good and adequate by almost three quarters of the participants. The median ASDKT's overall score for all questions was 16/23. General diabetes information score was 9/15 and for insulin therapy-specific questions was 7/8. The sources of information used in diabetic education were books and journals, through learning from colleagues, product literature and attending lectures were thought to be helpful. Pharmacists were prepared to enhance their education by meetings and lectures, Journals and books, audiotapes and self-education. **Conclusions:** Community pharmacists offer a readily accessible potential resource for diabetes education. Our survey of practicing pharmacists, elucidated their readiness to participate in a multidisciplinary diabetes management team. Incorporation of community pharmacists in any national diabetes educational program is necessary.

Key words: Diabetes, Community Pharmacists, Diabetes Education.

Introduction

Diabetes is increasing as a major public health problem in the developing world in general and amongst people of the Middle East and North African regions in particular (1-3). The concept of “total-patient care” and the approach of “multidisciplinary team work” are central principles in modern diabetes care (4). Patients’ empowerment and self-management mediated by education and motivation are very important (4). Logically, these would be more effective if support is delivered via readily accessible venues such as community pharmacies. Several models for involving community pharmacists in diabetes care have been described elsewhere (5-11) though they are not widely practiced in less developed parts of the world (12-13).

In Tripoli, Libya, a wide network of community pharmacies is available which could potentially undertake a valuable supporting role in diabetes care. However, knowing the pharmacists’ own level of readiness (knowledge and motivation) is a prerequisite step for any future planning. In the present study, we have therefore attempted firstly to evaluate diabetes-related attitudes and practices of community pharmacists in Tripoli, Libya and secondly to assess their basic knowledge of diabetes to evaluate their ability to undertake a diabetes educator role.

Material and Methods

Study Population

One hundred and forty six community pharmacists participated in the study in 2001/2002. They were managing privately-owned pharmacies. These are staffed by one or more qualified pharmacists and supported by non-qualified staff depending on size and activities. The objectives and methods were explained verbally and in writing. Out of the total 149 pharmacists who were approached, only three declined participation giving a response rate of 98 percent. Lack of time, lack of interest, and a perceived need to have authorization from the owner were the main reasons for the three pharmacists who declined participation.

Study Questionnaires

Two separate self-administered questionnaires were served:

1. A direct questionnaire in Arabic covering: a) availability of diabetic pharmaceuticals and monitoring

materials, b) the pharmacists’ perceived role in diabetes care (education and support) and c) their skills and wishes about furthering their education. The questions were structured by the authors during series of panel discussion sessions based on clinical experience and locally established medical and pharmacy practices.

2. The Arabic Short Diabetes Knowledge Test (ASDKT) consisting of a total of 23 multiple choice questions was used (13). The first 15 are general questions about diabetes and the remaining 8 questions were specific to insulin treated diabetes (Table 1). The questionnaire was based on the Michigan Diabetes Knowledge Test.

Data Processing

The answers were transferred into an Excel Spread Sheet (Microsoft Corporation, Redmond, USA) for descriptive analysis.

Results

Availability of Diabetic Medications and Materials

The supply of different diabetic medications was variable. Availability was stated as (consistently, intermittently or never). Insulin was generally not available (133/146). Metformin was between consistent and intermittent (45/146 and 89/146 respectively). Surprisingly, Sulphonylureas were either intermittently available or not available at all (52/146 and 87/146) respectively. Availability of urine glucose monitoring strips were more consistently available than blood testing strips and glucose meters. Herbal preparations and artificial sweeteners were more widely available than diabetic foods and glucose tablets (Table 2).

Pharmacists’ Perceived Role in Diabetes Care

The role of pharmacists in diabetes care was viewed as supply and dispensing by, dispensing and instruction and support of patients and help (Table 3). Diabetes educational activities by pharmacists included information on availability of relevant items 128(88%), counseling on the use of drugs 139(95%), instruction on use of glucose meters 102 (70%) and answering general questions about diabetes 142 (97%). Thirty-four (23%) of the respondents felt that the information they gave was good and adequate, 60 (41%) felt that it could be improved and 52 (36%) thought the information provided was inadequate.

Table 1. The contents of the modified Arabic Short Diabetes Knowledge Questionnaire (ASDKT). The question and most appropriate completion statement (the correct response or completion is given in parenthesis)

1. The diabetes diet is (healthy diet for most people).
2. Which of the following is highest in carbohydrate? (baked potato).
3. Which of the following is highest in fat? (Low fat milk).
4. Which of the following is a “free food”? (less than 20 calories per serving)
5. HbA1 is a test of average blood glucose level for the past (6-10 weeks)
6. Which is the best method for testing blood glucose? (blood testing)
7. What effect does unsweetened fruit juice have on blood glucose? (raises it)
8. Which should not be used to treat low blood glucose ?(1 cup diet soft drink)
9. What effect does exercise have on blood glucose ? (lowers it)
10. Infection is likely to cause an increase in blood glucose.
11. The best way to take care of your feet is to (look at and wash them each day)
12. Eating foods lower in fat decreases your risk for (heart disease)
13. Numbness and tingling may be symptoms of (nerve disease)
14. Which of the following is usually not associated with diabetes (lung problems).
15. Signs of ketoacidosis include (vomiting)
16. What to do when you are sick (Test for glucose and ketones more often)
17. The most likely time to have hypoglycaemia with NPH excess (6-12 hours)
18. Realized at lunch that you missed am insulin, What to do? (Check BG)
19. If you are beginning to have a hypoglycaemia, you should (drink some juice).
20. Low blood glucose may be caused by (too much insulin)
21. If you take morning insulin but skip breakfast (blood glucose will decrease)
22. High blood glucose may be caused by (not enough insulin)
23. Most likely cause a hypoglycaemia (heavy exercise)

Questions were re-phrased for due to space limitations. Full questionnaire is available form the corresponding author.

Pharmacists' Diabetes Knowledge

The overall ASDKT score [median (range)] for correct responses was 16/23 (69.6%) (Table 4). In the 15 general diabetes information questions the average score was 9(60.0%). This result was worse than the score achieved in the 8 questions related to insulin therapy which averaged 7 (87.5%). There was no difference in the total score between those who rated their educational input as well [15/23

(range 10-21)], as borderline [16/23 (range 8-22)] or as poor [15/23, (range 10-20)].

Sources of Pharmacists' Diabetes Knowledge and Scope for Improvement

Books related to diabetes were reported to be the main

Table 2. The consistency of availability of diabetic medications and supplies in Tripoli's community pharmacies

Questions	Consistent	Intermittent	Never
Insulin	2	11	133
Metformin	45	89	12
Sulphonylureas	7	52	87
Urine Glucose Testing Strips	18	83	45
Blood Glucose Testing Strips	14	75	57
Herbal and Alternative Medicine	102	29	15
Artificial Sweeteners	117	20	9
Glucose Tablets	21	85	40
"Diabetic" foods	20	36	90

Table 3. Pharmacists' Perceived Role in Diabetes Care

I. Perceived role of community pharmacists in diabetes care?	Respondents (n)	Percentages (%)
1. Supply and dispensing	117	80%
2. Dispensing and instruction	145	99.6%
2. Support of patients and help	143	98%
II. Reported "Educational" Activities Undertaken by Pharmacists:		
1. Providing information on availability of relevant items (medicines and supplies)	128	88%
2. Counseling on the use of drugs.	139	95%
3. Instruction on use of glucose meters.	102	70%
4. Answering general questions about diabetes in general.	142	97%

Table 4. Results of Short Diabetes Knowledge Test Scores

Questions	Score/Maximal [median]	Range	Correct Score (%)
I. The general score and the subscales for the whole group:			
Overall score	16/23	8-22	99.6%
General diabetes	9/15	3-15	60.0%.
Insulin therapy	7/8	3-8	87.5%
II. The general score (only) by groups of pharmacists according to their own perception:			
Good	15/23	10-21	65.2%
Borderline	16/23	8-22	69.6%.
Poor	15/23	10-20	65.2%

reference book by the majority of the pharmacists interviewed 132 (90%). Three quarters 109 (75%) of the studied sample reported that diabetes related journals were important source for their diabetic knowledge. Sixty one (42%) thought they learned mostly from interacting with colleagues, 64(44%) from reading product inserts and 71(49%) from attending lectures. Methods viewed as acceptable by pharmacists for furthering their education included attending lectures at meetings 71(49%), reading journals & books 68 (47%), listening to audiotapes 40 (27%) and undertaking various self-educational activities 71 (49%). Organization of further education was considered to be the responsibility of local health authorities (93%), diabetes and endocrine departments in teaching hospital (93%), the national medical specialization board (70%), medical & pharmacy schools (63%), the diabetes association (63%) and the pharmaceutical firms (47%).

Discussion

The present study attempted to assess the readiness of community pharmacists in Tripoli, Libya to undertake an extended role as diabetes educators in line with the recommendations of many professional bodies and experts (5-7). This question is particularly relevant to diabetes care in the real world as prevalence of diabetes has increased (3,15) with consequent increase in its burden on people and society (16,17). Pharmacists are the most accessible healthcare professionals to many chronically ill patients. It has been suggested that they see patients with diabetes up to five times more often than any other healthcare provider (18). They can potentially provide direct access to diabetes education and support on the high street. Traditionally, their services are accessed by extended working hours and without the restrictive systems of hospital appointments, thus enhancing the professional support to the patients' advantage. This is particularly valuable in parts of the world where multidisciplinary diabetes care teams are not yet well developed. Diabetes education and support professionals such as diabetes nurses and educators are scarce in our region (15-17). In recent years pharmacists' roles have expanded from simply packaging and dispensing medications to working with other health care professionals and the public. There is a large volume of published literature on the evolving role of the community pharmacist in chronic disease management. The role of pharmacists in diabetes management, including patient identification, assessment, education, referral, and monitoring has been well established elsewhere in the world (19-28). In Tripoli, Libya, there is an extensive network of over 600 community pharmacists. We thought it a golden opportunity to explore the role of these pharmacies in diabetes education since diabetes care was concentrated in only a couple of centers.

The present study has several important findings. The supply of diabetic medications (particularly insulin) and monitoring materials was inconsistent. The studied sample of pharmacists positively identified for themselves a role in diabetes care. Perceived assessment of their own educational activities was varied widely from "good" to "it could be improved" and even "inadequate". Pharmacists' knowledge of insulin therapy-related issues was better than their knowledge of the general aspects of diabetes care. Sources of their information were widely variable but pharmacists expressed interest to undertake further education by all means possible. All this information is important and would be helpful for future planning of structured diabetes education programs involving community pharmacists in the establishment of multidisciplinary teams.

Lack of supply of insulin may reflect national policies of drug distribution since insulin is provided by government facilities (17). However, limited supplies of other oral agents reflect logistical inefficiency (15). The irregular supply of testing strips and glucose meters may be due to a combination of the same logistical issues, variable demand and lack of support by both the manufacturers and government agencies. Predictably, herbal preparations were more readily available as they are not regulated as pharmaceutical preparations, are cheaper and may be provided by different class of vendors. Artificial sweeteners and glucose tablets should have been more consistently available than the level observed in this study. "Diabetic foods" are an outdated concept in modern diabetes care as current dietary recommendations do emphasize the healthy nature of the diabetic diet.

The stated attitudes towards diabetes care by the participating pharmacists were positive though these were not matched by the actual practiced diabetes educational activities. Variable pharmacists' attitudes towards diabetes were reported elsewhere (18). There was no relationship between the pharmacists' own assessment of the quality of their diabetes educational activity and the achieved knowledge test scores. This may suggest the lack of insight into what is expected from involvement of pharmacists in diabetes care.

The main source of the pharmacists' information in this study were books and journals. However, the pharmacists also expressed their interest in a wider range of other methods for further education. This suggests a good level

of motivation which could be the basis for setting future regular organized continued professional development programs in addition to regular electronic and printed newsletters. Appropriate targeted specialist educational training should be incorporated into a multidisciplinary team. Developments of such activities may eventually lead to some form of "Pharmacist Diabetes Certified Educator" working within the multidisciplinary team. Positive clinical and economic impact of pharmacists' involvement in diabetes care (22-24,28) supports the call for their further development. Positive improvement in glycemic control has been shown in type 2 diabetic patients requiring insulin (26). Pharmacist consultations provided to diabetic patients have been shown to decrease total healthcare costs (22-24, 28). Patient-focused pharmacist intervention in the community retail setting with several chronic conditions including diabetes produced a significant economic impact shown through several analyses (22-25,28). Therefore, recruitment of interested pharmacists similar to those identified in our study would help bring about a more clinically-relevant and cost effective metabolic control.

Some limitations may be identified. Convenience sampling has its inherent limitations; however, the included pharmacists are likely to be fairly representative of the target population based on the sample size (146 out of 700) and the fact that they were based in parts of the city and the response rate was very high. In addition, there seemed to be fair uniformity of the size, distribution, staffing levels and professional activities of the pharmacies in the city. The survey employed mostly closed ended questions, multiple choice questions and 3-4 point scales to simplify the answers. The knowledge questionnaire was basic (12,13) as the aim of the study was to assess their ability to educate rather than their academic performance and hence it used an Arabic version (13) as this would be the language that pharmacists would use to communicate with the patients though they may have been educated in English.

In conclusions, community pharmacists are potentially good sources of diabetic education. The study showed that they are interested and ready to be incorporated in the multidisciplinary diabetes care teams. National diabetes education programs should incorporate pharmacists as active participants by adapting established working models to the local needs and circumstances.

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