Biomedical Research 2018; 29 (19): 3638-3642 *ISSN 0970-938X*
www.biomedres.info

Pharmacy students' knowledge and attitudes towards diabetes: a cross-sectional study.

Syed Wajid[1], Mohammed N. Al-Arifi[1], Salmeen D Babelghaith[1], Atta Abbas Naqvi[2], Sultan S. Althagfan[3], Mansour Adam Mahmoud[3*]

[1]Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia

[2]Departmet of Pharmacy Practice, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

[3]Clinical and Hospital Pharmacy Department, Taibah University, College of Pharmacy, Taibah University, Al-Madinah Al-Munawara, Saudi Arabia

Abstract

Objective: This study aimed to evaluate knowledge and attitudes of pharmacy students about diabetes mellitus.
Methods: A cross sectional study using self-administered questionnaire was conducted from 25th February to 15th March 2018 among pharmacy students of King Saud University. A total of 120 students were randomly recruited using a multistage sampling method and were invited to participate in the study.
Results: A total of 43.1% (n=50) of the students had a good knowledge about diabetes mellitus. Majority 74.2% (n=86) agreed that personal efforts will help to manage or control diabetes mellitus. Almost all of them (97%) described diabetes as a high blood sugar, about 96% of the students identified frequent urination, followed by frequent hunger 56%, frequent thirst 69% as main symptoms of the disease. Most students (70%) believed that diabetes mellitus is a genetic disorder. Most common complications mentioned by students were eye disease (65%), foot problem (62%), kidney diseases (59%) and cardiovascular diseases (42%).
Conclusion: The finding of this study indicate that students had an adequate knowledge and attitudes about diabetes mellitus, however there is a need for further improvement in knowledge and attitudes about diabetes mellitus prevention strategies and complications.

Keywords: Diabetes mellitus, Pharmacy, Students, Saudi Arabia.

Accepted on October 25, 2018

Introduction

Diabetes mellitus (DM) is a global health concern [1]. According to the World Health Organization (WHO) report, more than 422 million individuals worldwide are living with it [2]. The number is expected to increase further to 552 million by 2030 and 642 million by 2040 with the majority of patients belonging to low and middle-income countries [3]. By 2030, the disease is projected to be ranked at seventh position in terms of its global mortality rate [4]. According to International Diabetes Federation (IDF), approximately 39 million people in the Middle East and North Africa (MENA) region have diabetes and the numbers are projected to increase up to 67 million to by 2045. In Saudi Arabia alone, there were 3,852,000 new cases of DM in 2017 [5].

The disease is a group of metabolic disorders characterized by elevation in blood glucose level due to either a deficiency in insulin secretion and/or action [6,7] The symptoms are polyuria, polydipsia and polyphagia. Complication may include macrovascular i.e., cardiovascular illness and microvascular i.e., kidney and eye problems [8-10]. Risk factors include obesity, sedentary life style activities along with family history [11]. The disease may cause more disease burden in the form of comorbidities such as central nervous system disorders and cardiovascular illnesses namely depression, hypertension among others [6,12,13].

Knowledge regarding the disease is essential to manage it appropriately. Several studies have document knowledge about DM. A recent study conducted among Chinese college students and reported that students had limited knowledge about diabetes and its management [14]. A study conducted in university students of Ajman, United Arab Emirates (UAE) and reported unsatisfactory knowledge about DM while medical students from Uganda had adequate knowledge [15,16].

To the best of our knowledge there is a lack of studies regarding students' knowledge and attitudes towards DM in

Saudi Arabia. Students need to have up-to-date and evidence based knowledge about diabetes mellitus. The disease pathophysiology, clinical presentation, diagnosis, treatment and latest guidelines must be taught to the pharmacy students. In addition the students need to understand the complication of diabetes, risk factors and consequences resulting from defect in management and lack of early detection of diabetes. Treatment options, medication dose calculation and dosage adjustments are crucial to achieve the best patient outcomes. Therefore, the current study aimed to assess the knowledge and attitudes of pharmacy students regarding DM among pharmacy students at Riyadh Saudi Arabia. The study result may help academician to understand pharmacy student's strength and weaknesses and draw a road map for improvement.

Methods

Study design

A cross sectional study using self-administered questionnaire was conducted from 25th February to 15th March 2018 to evaluate the knowledge and attitudes of pharmacy students regarding diabetes mellitus.

Inclusion criteria

The students were enrolled in College of Pharmacy at a Saudi University at Riyadh, Saudi Arabia. We included entry level Doctor of Pharmacy (Pharm. D) students and third year Bachelors in Pharmacy (B. Pharm) students in the study. Students from other universities.

Study materials

A questionnaire was prepared from literature search using pertinent key words (diabetes mellitus, knowledge, attitudes). The developed questionnaire comprised of 23 items divided into three sections. The first section included demographic information (age, gender, faculty type, study year, nationality, family medical history, self-medical history, physical exercise and self-assessment of diabetes knowledge). The second section comprised of 4 questions that evaluated the attitudes of participants towards DM (I have little control over risks to my health, If I am going to get DM, there is not much I can do about it, My personal efforts will help control my risks of getting DM, People who make a good effort to control the risks are much less likely to get DM). The third section evaluated the knowledge of DM and consisted of 14 questions (Participant's idea about nature of DM, age groups at risk of DM, gender is prone to DM, course of this treatment for DM, symptoms, causes, complication, prevention and treatment of DM).

Scoring

The knowledge score was calculated for each correct answer for the questionnaire by giving (1) one mark to the correct answer and (0) zero to wrong answer. We considered score less than 16 out of 23 as poor knowledge and a score more than 16 was considered as good knowledge score. Students were informed that the survey will be anonymous and recorded responses would be used for scientific purposes only. Formal approval was obtained from the university college of pharmacy to carry out this study.

Data analysis

Descriptive statistics including percentages; means and frequency distribution were used for each variable. Statistical Package for Social Sciences version 22.0 (SPSS Inc., Chicago, IL, USA) was used for statistical computations.

Results

A total of 116 male pharmacy students filled the questionnaire. Nearly half of them were aged between 18-20 y old and 51.7% (n=60) aged between 21-25 y old. A third proportion of students 31% (n=36) were enrolled in B. Pharm degree program, while the majority 69% (n=80) studied Pharm. D degree. Most students 97.4% were Saudis (n=113). A detailed description of demographics is shown in Table 1.

Table 1. *Demographic and some features of the participants.*

Characteristics	Number (n)	Percentage (%)
Age in years		
18-20	55	47.4
21-25	60	51.7
26-30	1	0.9
Faculty type		
B. Pharm	36	31
Pharm. D	80	69
Nationality		
Saudi	113	97.4
Non-Saudi	3	2.6
Does any of your a family member or relative have/had diabetes mellitus?		
Yes	85	73.3
No	31	26.7
Do you suffer from diabetes?		
Yes	5	4.3
No	110	95.7
Physical exercise		
Regular walking	47	40.5
Irregular walking and other exercise	45	38.8
No exercise	24	20.7

Do you have knowledge about DM?		
Yes	98	85.2
No	17	14.8

Most pharmacy students believed that they had little control over their risks 57.8% (n=67). However, when asked about (if you are going to get DM, there is not much you can do about it) the majority 89% of them disagreed or strongly disagreed with this statement. A good majority 74.2% (n=86) agreed or strongly agreed about the statement that personal efforts will help to manage or control the disease. Most of them (77.6%) were agreed or strongly agreed that individuals who can control the risks are less likely to get DM (n=90). The detail about student's attitudes towards diabetes is given in Table 2.

Table 2. *Student's attitude toward diabetes mellitus.*

Variables	Strongly agree (N (%))	Agree (N (%))	Strongly disagree (N (%))	Disagree (N (%))	Not sure (N (%))
I have little control over risks to my health	19 (16.4%)	48 (41.4%)	6 (5.2%)	19 (16.4%)	23 (19.8%)
If I am going to get DM, there is not much I can do about it.	15 (12.9%)	12 (10.3%)	30 (25.9%)	43 (37.1%)	16 (13.8%)
My personal efforts will help control my risks of getting DM	35 (30.2%)	51 (44%)	13 (11.2%)	4 (3.4%)	13 (11.2%)
People who make a good effort to control the risks are much less likely to get DM	54 (46.6%)	36 (31%)	7 (6%)	7 (6%)	12 (10.3%)

Nearly 70% of the students reported that they had an idea of the nature of disease, more than half of them correctly identified age groups prone to DM, 89.7% of the students identified both men and women are at risk of suffering from diabetes mellitus. The majority 97% described the condition as high blood sugar, about 96% of the students identified frequent urination (polyuria) as the main symptoms followed by frequent hunger (polyphagia), highlighted by 56% of students and frequent thirst (polydipsia) as mentioned by 69% of students. About 68% of the students thought that insulin deficiency is the main cause of DM while majority of them 70% believed DM is genetic disorder. Most commonly reported complication of DM was, eye disease, mentioned by 65% of students, foot problem 62%, kidney diseases 59% and cardiovascular diseases 42%. The majority (96%) mentioned that healthy diet followed by weight control and regular exercise (94%) will help prevent DM. Most students (90%) mentioned insulin as the drug of choice in treatment followed by healthy diet (83%), weight control (81%) and regular exercise (78%) (Table 3).

Table 3. *Knowledge of diabetes mellitus among pharmacy students.*

Variables	Correct answer N (%)	Incorrect answer N (%)
Participant's idea about nature of DM	80 (69)	36 (31)
Which age groups are most commonly affected by DM?	66 (56.9)	50 (43.1)
Which gender is prone to DM?	104 (89.7)	12 (10.3)
What is the course of treatment of this disease?	54 (46.6)	62 (53.4)
Most common symptoms of DM		
Frequent urination	96 (82.8)	20 (17.2)
Frequent hunger	56 (48.3)	60 (51.7)
Frequent thirst	69 (59.5)	47 (40.5)
Knowledge about the cause of DM		
Insulin deficiency	68 (58.6)	48 (41.4)
Genetics	70 (60.3)	46 (39.7)
Most common complications of DM		
Heart diseases	42 (36.2)	74 (63.8)
Kidney diseases	59 (50.9)	57 (49.1)
Eye disease	65 (56)	51 (44)
Stroke	34 (29.3)	82 (70.7)
Foot problem	62 (53.4)	54 (46.6)
Measures to prevent DM		
Healthy diet	96 (82.8)	20 (17.2)
Weight control and regular exercise	94 (81)	22 (19)
Keep normal blood pressure	40 (34.5)	76 (65.5)
Quit smoking	40 (34.5)	76 (65.5)
Method of treatment for DM		
Drugs	74 (63.8)	42 (36.2)
Insulin	90 (77.6)	25 (21.6)
healthy diet	83 (71.6)	33 (28.4)
Regular exercise	78 (67.2)	38 (32.8)
Weight control	81 (69.8)	35 (30.2)
Quit smoking	39 (33.6)	77 (66.4)

Discussion

This study was conducted among pharmacy students in Riyadh, Saudi Arabia. Most students were Saudi, aged between 18-20 y and were studying Pharm. D. Several studies have reported similar enrolment in other colleges of Saudi Arabia [17,18]. The majority of students indicated that diabetes mellitus is prevalent in their family. According to official figures from health authorities, the prevalence of DM in Saudi patients is approximately 13.4% [19]. A small fraction of students disclosed that they suffer from diabetes mellitus. Albusalih et al. have previously reported a small segment of pharmacy students from other university to suffer from chronic illnesses such as diabetes mellitus [15]. Majority of the students indicated that they have knowledge about DM and believed that physical exercise i.e., regular walking may reduce the likelihood of suffering from DM. Literature indicates that the risk of suffering from DM increase owing to a sedentary lifestyle, irregular dietary patterns and high body mass index (BMI). Students correctly identified the common symptoms, causes, complications of the disease and the drug of choice.

However, students had a pessimistic approach to control the risk factors of DM as they mentioned that they had no control over those risk factors. Evidence highlights that one of the risk factors of DM in Saudi population is obesity, sedentary lifestyle and therefore this pessimistic approach highlights non-desire to modify lifestyle change. It is startling as pharmacist are ingrained with patient centered approach and patient counselling techniques during their studies and they are deemed effective patient counsellors who have the potential to modify a patient's lifestyle through such interventions. Nevertheless, the students mentioned that personal efforts would limit the risk of suffering from DM.

In our study more than half of the students had poor knowledge about DM. This is in line with the findings of Khan and colleagues in Emirati students that despite being provided with resources, majority of students fail to gain adequate knowledge about DM [11]. In contrast, a large-scale study conducted in Kuwaiti high school students reported majority to have adequate knowledge about the disease [20].

This highlights that resources alone are not enough to inculcate disease knowledge, but a comprehensive approach is required at the college level to review curriculum relating to pharmaceutical care and pharmacy practice and develop strategies for preparing pharmacy students as effective patient counsellors as well as disease educators.

Recommendation

The prevalence of DM is growing not only among the elderly but also among teenagers and children [21,22]. Therefore, active and effective health promotion and control programs should be encouraged in order to prevent escalation of the prevalence of DM worldwide. Through diet control, exercise and lifestyle modification about 80% of DM cases can be prevented [21]. According to this study finding it is recommended that pharmacy students with their thorough knowledge about DM could have a positive impact and play an important role in programs that aim to increase public awareness and knowledge about DM which could ultimately decrease the prevalence of DM.

Conclusion

The findings of our study highlight the need to create awareness amongst students to learn about diseases especially those relative to Saudi Arabia's population. This also highlights the need to reinforce curriculum for pharmaceutical care with emphasis on disease knowledge and attention must be paid to invigorate effective patient counselling exercises and drills that may require students to learn in detail about the disease.

Acknowledgment

The authors would like to thank the deanship of Scientific Research College of Pharmacy, King Saud University, Riyadh, Saudi Arabia.

References

1. Hussain M, Naqvi SBS, Khan MA, Rizvi M, Alam S, Abbas A, Akram M. Direct cost of treatment of diabetes mellitus type 2 in Pakistan. Int J Pharm Pharm Sci 2014; 6: 261-264.
2. World health organization. Global report on diabetes 2018.
3. International diabetes federation. IDF Diabetes Atlas (5th Edn.). Available from: https: //www.idf.org/e-library/epidemiology-research/diabetes-atlas/20-atlas-5th-edition.html.
4. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med 2006; 3: e442.
5. International diabetes federation (IDF) 2018.
6. Abbas A, Nasir H, Zehra A, Noor A, Jabbar FA, Siddiqui B. Assessment of depression as comorbidity in diabetes mellitus patients using beck depression inventory II (BDI II) Scale. J Young Pharm 2015; 7: 206-216.
7. Abbas A, Sabah A, Ahmed FR, Tanwir S. Views of health care professionals regarding different types of commercially available insulins. J Biotechnol Sci Res 2014; 1: 1-8.
8. American Diabetes Association (ADA) 2018.
9. Naqvi AA, Shah A, Ahmad R, Ahmad N. Developing an integrated treatment pathway for a post-coronary artery bypass grating (CABG) geriatric patient with comorbid hypertension and type 1 diabetes mellitus for treating acute hypoglycemia and electrolyte imbal. J Pharm Bioall Sci 2017; 9: 216-220.
10. Shah A, Naqvi AA, Ahmad R. The need for providing pharmaceutical care in geriatrics: A case study of diagnostic errors leading to medication-related problems

in a patient treatment plan. Arch Pharma Pract 2016; 7: 87-94.

11. Khan N, Gomathi KG, Shehnaz SI, Muttappallymyalil J. Diabetes mellitus-related knowledge among university students in Ajman, United Arab Emirates. Sultan Qaboos Univ Med J 2012; 12: 306-314.
12. Fawad H, Maqsood M, Abbas A. The association between type-II diabetes mellitus and hypertension: A case report. Int J Allied Med Sci Clin Res 2014; 2: 182-185.
13. Abbas A. The association of type II diabetes mellitus and Parkinsons disease: A case report. El Med J 2014; 2: 36-37.
14. Xu Y, Zhang D, Liu K. Self-reported knowledge on diabetes and its related factors among Chinese college students: a cross-sectional study. BMJ Open 2016; 6: 011963.
15. Albusalih FA, Naqvi AA, Ahmad R, Ahmad N. Prevalence of self-medication among students of pharmacy and medicine colleges of a public sector University in Dammam City, Saudi Arabia. Pharmacy 2017; 5, 51.
16. Kharono B, Nabisere R, Kiddu Persis N, Nakakeeto J, Openy A, Bakeera Kitaka S. Knowledge, attitudes, and perceived risks related to diabetes mellitus among university students in Uganda: a cross-sectional study. East Afr Health Res J 2017; 1: 105-112.
17. Abbas A, Kachela B, Arif JM, Tahir KB, Shoukat N, Ali NB. Assessment of medication adherence and knowledge regarding the disease among ambulatory patients with diabetes mellitus in Karachi, Pakistan. J Young Pharm 2015; 7: 328-340.
18. Aljaouni ME, Hafiz AA, Alalawi HH, Alahmadi GA, AlKhawaja I. Self-medication practice among medical and non-medical students at Taibah University, Madinah, Saudi Arabia. Int J Acad Sci Res 2015; 3: 54-65.
19. Saudi Health Information Survey for Non-communicable disease in Kingdom of Saudi Arabia. Ministry of Health. KSA 2013.
20. Al-Hussainia M, Mustafa S. Adolescents knowledge and awareness of diabetes mellitus in Kuwait. Alexandria J Med 2016; 52: 61-66.
21. Duncan GE. Prevalence of diabetes and impaired fasting glucose levels among US adolescents: National Health and Nutrition Examination Survey, 1999-2002. Arch Pediatr Adolesc Med 2006; 160: 523-528.
22. World Diabetes Foundation Diabetes Fact Sheet 2018.

*Correspondence to

Mansour Adam Mahmoud

Clinical and Hospital Pharmacy Department

College of Pharmacy

Taibah University

Saudi Arabia