

Populations knowledge of diabetes and the role of nutritional therapy in controlling the disease in Basrah city: A cross-sectional study of assessment

Rana D. S. ALkamil¹, Rasool Chalob², Qutaiba A. Qasim¹, H. N. K. Al-Salman³

¹Department of Clinical Laboratory Sciences, College of Pharmacy, University of Basrah, Basrah, Iraq,

²Department of Pharmacology and Toxicology, College of Pharmacy, University of Basrah, Basrah, Iraq,

³Department of Pharmaceutical Chemistry, College of Pharmacy, University of Basrah, Basrah, Iraq

Abstract

Introduction: Diabetes mellitus is a clinical syndrome of disturbed metabolism of carbohydrates, protein, and fat that are associated with hyperglycemia due to absolute or relative insulin deficiency. Worldwide, the incidence of diabetes has been increased. By the year 2030, over 347 million persons have diabetes. Nutrition therapy is an essential intervention of diabetes management. The prior concepts of diabetes management are to decrease microvascular and macrovascular disease risks complications, thereby decreasing mortality, and to improve quality of life. These goals can achieve by giving each patient knowledge and support, which consider the principal role of the health-care team. Our study was achieved to study the demographic aspects of diabetic patient's attitude and their knowledge of the role of nutritional therapy as new era in the management of diabetes. **Materials and Methods:** All the screened populations were included in the study after getting their verbal consent. The questionnaire had 12 questions. Personal parameters of participants such as age, gender and family History of diabetes, response to knowledge and questionnaire attitudes. The questionnaires were distributed by the researchers to the participants and collected after completion. Uneducated participants were assisted by verbal interviews based on the questions in the questionnaire and the appropriate responses were recorded. **Results:** We studied 89 patients, of which 42.7% were male and 57.3% were female with a mean age of 45 years. About 25% of patients has positive family history; majority of participants (63%) does not know what diabetes is? About 63% of people believed that nowadays is more and more people are affected by diabetes. About 24% of patients knew that diabetes could be prevented by both diet and exercise. About 67% of patients believed that medication is more important than diet. **Conclusions:** The study reveals very less number of patients received patient education and counseling regarding disease, medication, and lifestyle modification for diabetic patients can greatly affect patient's outcomes. The study shows the need for educational and counseling programs aimed to improve the knowledge of diabetes.

Key words: Diabetes, patient counseling, quality of life, questionnaire

INTRODUCTION

Diabetes mellitus is a clinical syndrome of disturbed metabolism of carbohydrates, protein, and fat that are associated with hyperglycemia due to absolute or relative insulin deficiency.^[1] Deficiency of insulin secretions results in a significant disturbance of water and electrolyte homeostasis caused by improper metabolism of carbohydrate, protein, and fat,^[1] Worldwide, the incidence of diabetes has been increased. By the year 2030, over 347 million persons have diabetes.^[2] In 2009, 2.4 million people had diabetes and the number is

expected to increase by the year 2019 to reach 3.7 million in Canada.^[3] This may reflect the economic burden of diabetes in Canada, which expected to increase from \$6.3 billion in 2000 to reach \$16.9 billion by the year 2020.^[4] Nutrition therapy is an essential intervention of diabetes management.

Address for correspondence:

H. N. K. Al-Salman, Department of Pharmaceutical Chemistry, College of Pharmacy, Basrah University, Iraq.
Phone: +9647702683703. E-mail: hsennaserh@yahoo.com

Received: 11-05-2019

Revised: 07-06-2019

Accepted: 14-06-2019

It is so obviously in the recent studies that improving dietary intake can reduce glycated hemoglobin (Hb_{A1C}),^[5,6] mediate weight loss, and finally improve clinical outcomes.^[6,7]

Diabetes has considerable impact on each individual patient life because it is a chronic incurable syndrome. For the successful care of diabetic patients, patient should consider a crucial part of management process and its involvement is a paramount for that purpose.^[8,9] The prior concepts of diabetes management are to decrease microvascular and macrovascular disease risk complications, thereby reducing mortality and improving quality of life. These goals can achieve by giving each patient knowledge and support, which consider the principal role of the health-care team.^[10,11] Lack of patients understanding characteristics such as attitude and personality of the patient cause unreliable guidance about the disease.^[12] For example, in Nepal, the public knowledge and awareness process about DM is improper due to poor medical services.^[13] The level of diabetic patient knowledge has been improved by achieving several interventions.^[14]

The first step in establishing a program for prevention of diabetes is obtaining information about diabetic patient level of awareness in a population.^[15,16] Different studies showed that the diabetic patient outcomes and quality of life management could be improved by intensive diabetes education.^[17] Our study was achieved to study the demographic aspects of diabetic patient's attitude and their knowledge of the role of nutritional therapy as new era in the management of diabetes. Many studies have showed that proper glycemic control can reduce the complications of diabetes.^[18] The good control is achieved by increasing the patient's adherence to medications, frequent monitoring of blood glucose, lifestyle modifications, etc. This can be proceeding by enhancing patient education and counseling.^[18]

One of the most essential parts of the treatment and self-management of diabetic patients is nutrition therapy and counseling. As we said earlier, the nutrition therapy goals are to improve quality of life and nutritional and physiological health; and to treat and prevent acute- and long-term complications of diabetes.^[19] It is well documented that nutrition therapy can enhance glycemic control by reducing Hb_{A1C} by 1.0%–2.0%^[6,20] and it can further improve clinical and metabolic outcomes when used with other components of diabetes care^[5,7,21,22] resulting in decreased rates of hospitalization.^[23]

Nutrition therapy and self-management education should incorporate.^[24] Counseling delivered in either a small group and/or an individual setting.^[25,26] This step has provided benefits for those with, or at risk for, diabetes.^[22] Individual education and counseling will be preferred for people with low socioeconomic status.^[23] For establishing good adherence to any dietary approach, nutrition therapy and meal planning should be individualized to meet the individual's values and preferences, which take in consideration age, culture, duration and type of diabetes, nutritional requirements, lifestyle, concurrent medical therapies, economic status,^[27] activity level, and food

intolerances.^[28] This individualized approach accommodates with that of other clinical practices.^[29,30] Many studies have designed a questionnaire to figure out the adherence to disease-relevant guidelines^[31,32] or specific diets.^[33,34]

The present study aimed to investigate the effect of increasing individual's knowledge and counseling on the diabetic patient's outcomes and their adherence to lifestyle modification such as diet restriction using questionnaire.

MATERIALS AND METHODS

This study was carried out from March 20 to July 3, 2018, in Basra city. All the screened populations were included in the study after getting their verbal consent. The questionnaire had 12 questions. Participant profile parameters such as age and gender, family history of diabetes, response to knowledge and attitude questionnaire. The data were analyzed using Microsoft Excel spreadsheet.

Statistical Analysis

The questionnaires were distributed by the researchers to the participants and collected after completion. Uneducated participants were assisted by verbal interviews based on the questions in the questionnaire and the appropriate responses

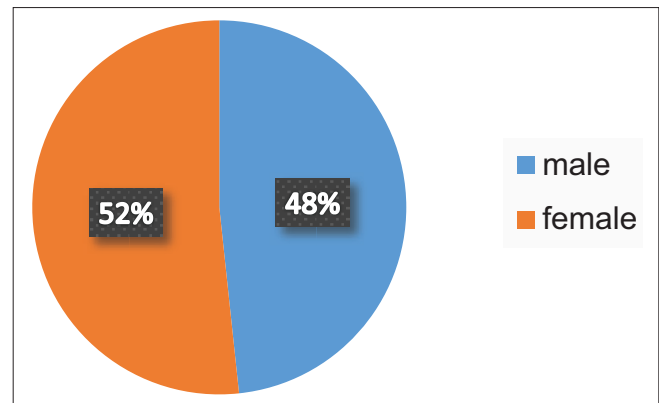


Figure 1: Gender distribution of population studied

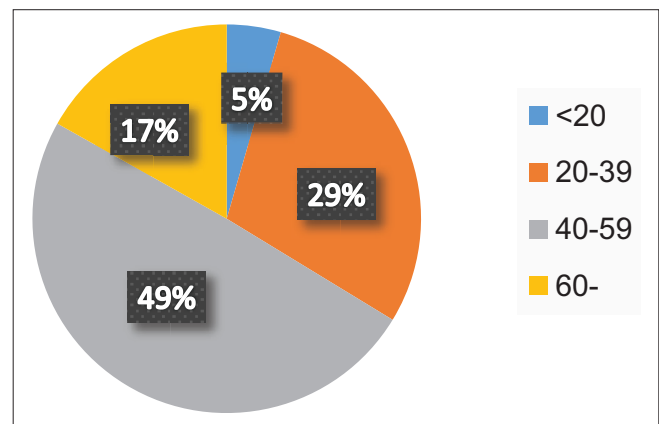


Figure 2: Age distribution of population studied

were recorded. The information was recorded and analyzed using the Microsoft Excel worksheet (Microsoft Office 2010).

RESULTS

The total number of participant was 89 individuals, 48% were male and 52% of females [Figure 1]. The demographic data such as gender, age, and education were recorded. The mean age of the study population was 45. Among 89 patients, 25% were diabetic patients and 75% were non-diabetic patients.

Table 1: Retrieve questions about patient responses to knowledge

Questions	Responses	
	Yes	No
1 Do you know about diabetes?	37	37
2 Do you know diabetes is affecting more and more people now day?	96	96
3 Do you think some factors can contribute diabetes such as family history?	89	89
4 Can diabetes be transmitted among population?	4	4
5 Do you know diabetes can cause complications?	57	57
6 Do you think that diabetes can be prevented by diet restriction and exercise only?	24	24
7 Do you think that diet and exercise equally important in controlling diabetes as medication such as insulin?	33	33
8 Do you know the value of normal blood glucose level?	27	27
9 Do you exercise?	44	44
10 Do you consider yourself on healthy diet?	48	48
11 Do you know what kind of diet should a diabetic eat?	42	42
12 Do you think that if you avoid taking only sugar and sweets, your blood glucose levels will be under control?	52	52

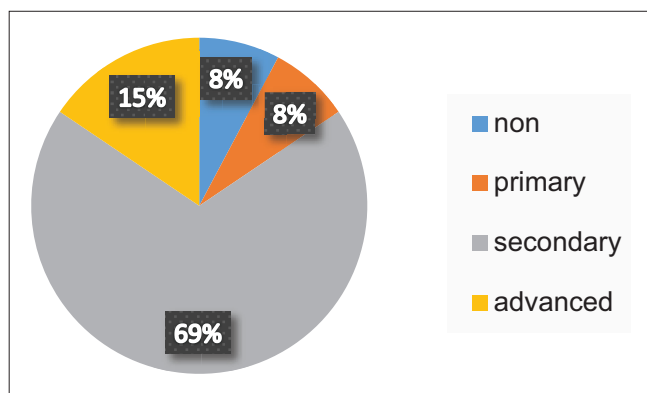


Figure 3: Education distribution of population studied

The response of the patients regarding the knowledge-related questions is listed in Table 1.

Diabetes and Nutritional Therapy Questionnaire

Assessment questions regarding population knowledge of diabetes.

1. Do you know about diabetes?
2. Do you know diabetes is affecting more and more people nowadays?
3. Do you think some factors can contribute diabetes such as family history?

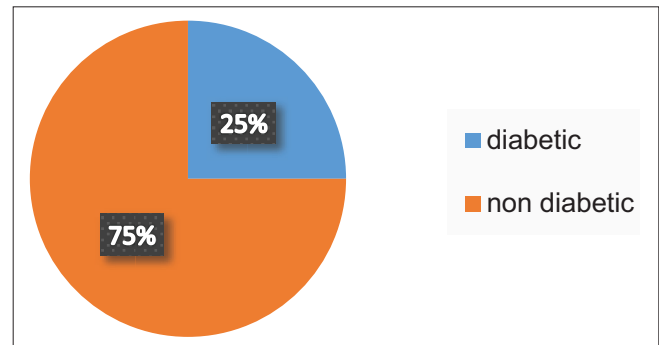


Figure 4: Diabetic patient distribution of population studied

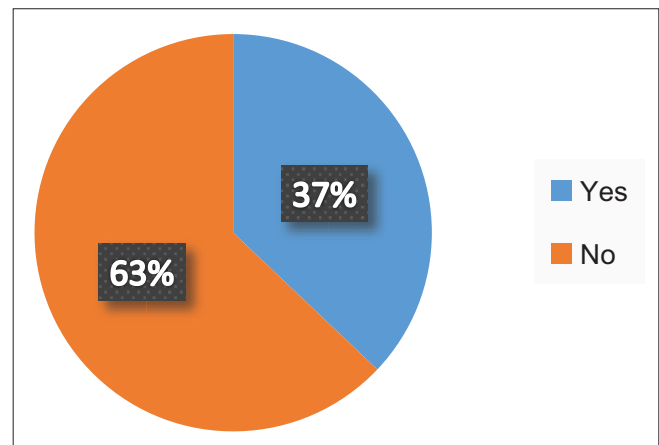


Figure 5: Knowledge of diabetes in studied population

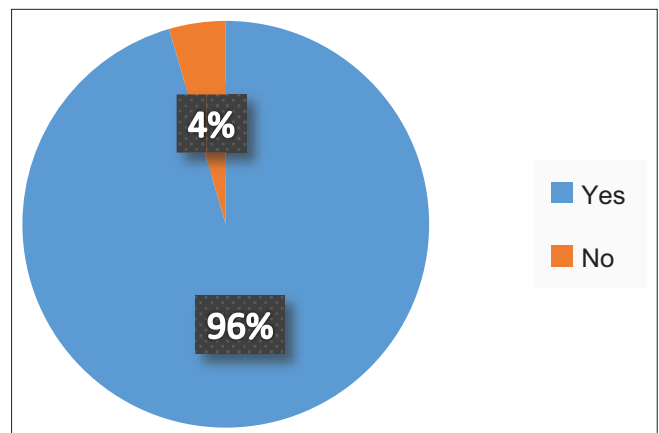


Figure 6: Knowledge of how diabetes is affecting more people

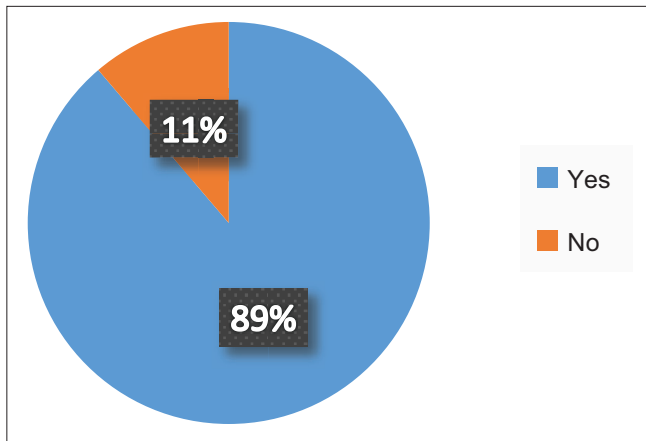


Figure 7: Knowledge of population studied regarding contributing factors in diabetes such as family history

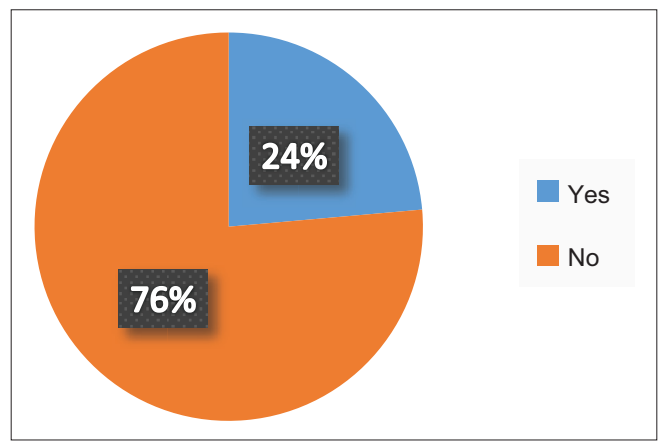


Figure 10: Knowledge of participants about the effect of diet and exercise in prevention of diabetes

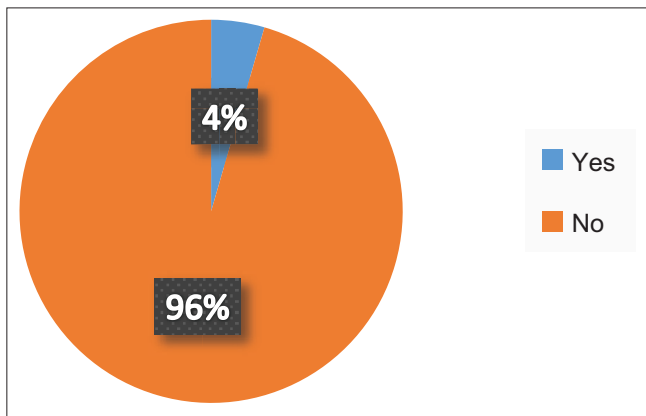


Figure 8: Knowledge of participants about transmission of diabetes among population

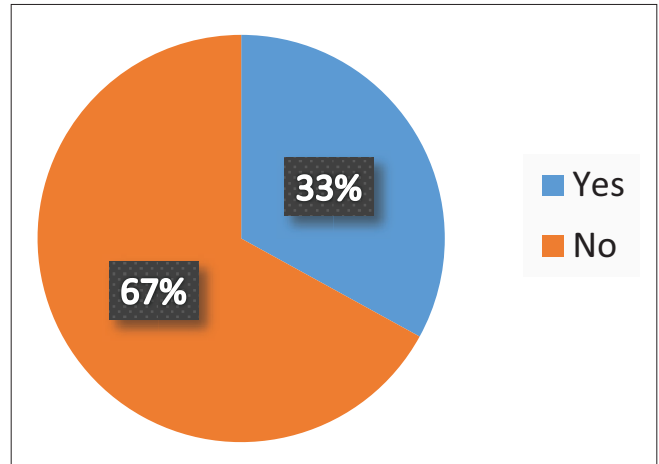


Figure 11: Knowledge of participants about the effect of diet and exercise in controlling diabetes with equal importance as medications like insulin

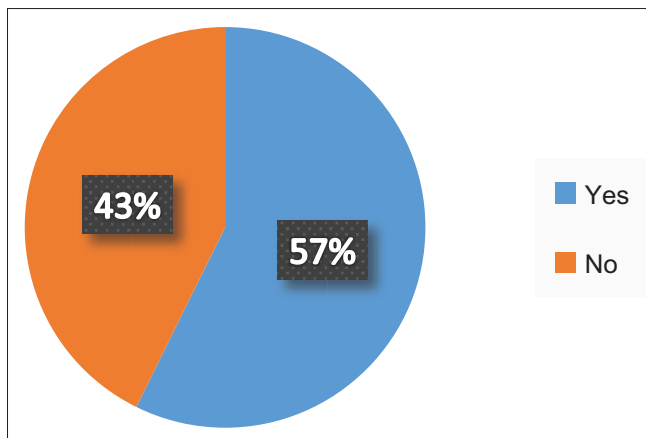


Figure 9: Knowledge of participants about diabetes complications

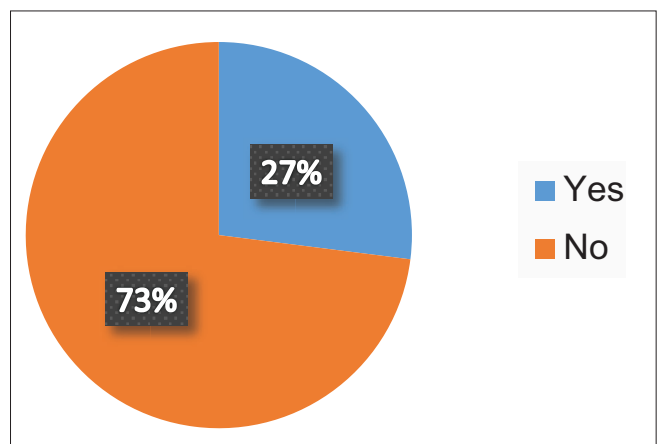


Figure 12: Knowledge of participants about the normal values of blood glucose

4. Can diabetes be transmitted among population?
5. Do you know diabetes can cause complications?
6. Do you think that diabetes can be prevented by diet restriction and exercise only?
7. Do you think that diet and exercise equally important in controlling diabetes as medication such as insulin?
8. Do you know the value of normal blood glucose level?

9. Do you exercise?
10. Do you consider yourself on healthy diet?
11. Do you know what kind of diet should a diabetic eat?
12. Do you think that if you avoid taking only sugar and sweets, your blood glucose levels will be under control?

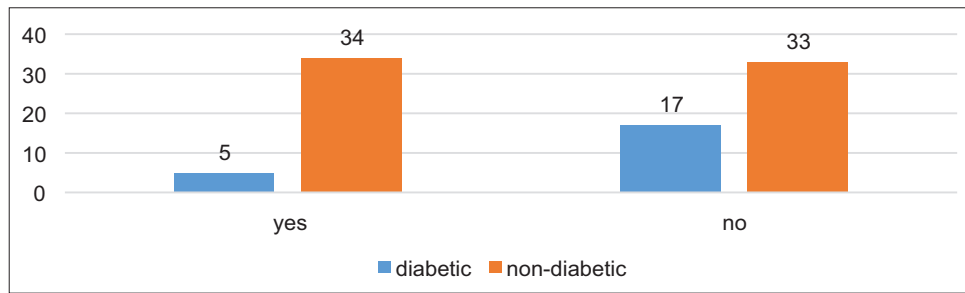


Figure 13: Knowledge of participants about if they doing exercise

DISCUSSION

Eighty-nine participants were included in this study. Females were more in number than males. Among the 89 participants, 52% of subjects were female and 48% were male [Figure 1]. The demographic data of participants were recorded such as age, gender, and education status [Figure 1-3]. The mean age of the population studied was 45 and the percentage of diabetic patients among participants was (25%) [Figure 4].

In the present study, the most of participants showed an improper level of knowledge of diabetes; this obviously appears in Figure 5. This is expected since 69% of participants were having a secondary education level while 8% of them were illiterate [Figure 3]. The knowledge of the subjects pertaining to the prevalence of diabetes revealed that a significant number of individuals (63% of participants) thought that more and more people were affected by diabetes nowadays [Figure 5]. The results showed that a significant number of participants (89%) thought that the disease caused by factors other than lack of insulin such as positive family history (inherited disorder) [Figure 6]. About 67% of the participants thought that diabetes is an infectious disease, i.e. it spreads from one person to other person [Figure 7], this might reflect the poor knowledge level of the respondents. Lack of knowledge of this magnitude will likely place diabetics at risk of doing things, which might predispose them to complications although it is well known that patients passively learn to recognize the symptoms once they suffer from it, 43% of participants have poor responses about complication [Figure 8].

Regarding the knowledge of the complications, 57% of participants answered that diabetes could cause complications. About 24% of the respondents only believed that diabetes is preventable by diet control and exercise [Figure 9]. This indicates a significant lack of knowledge of primary prevention of diabetes in population. The fact that 67% of respondents believed that medication is more important in controlling diabetes than diet and exercise, reflects great extent of medication adherence [Figure 10].

Although 33% agree with that opinion, which show greater extent of medication adherence and the medication is very important in controlling the disease. It was surprising to know that only 27% of the subjects were aware of the target values of

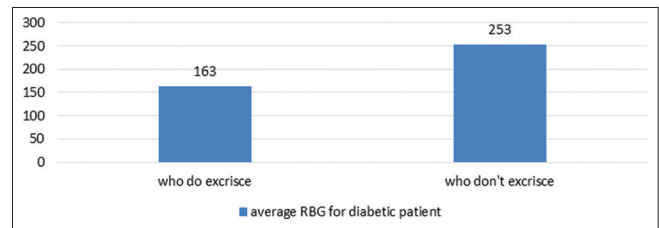


Figure 14: Effect of exercise on the average level of RBG of the studied population

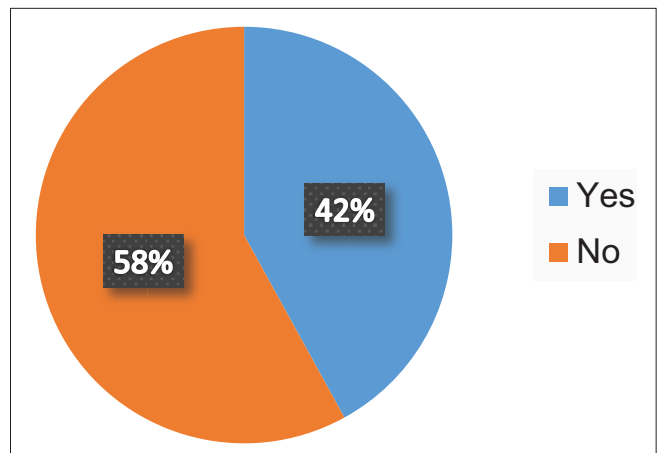


Figure 15: Participants should know what kind of healthy diet to follow

blood glucose [Figure 11]. Seventeen of the diabetic respondents said that they do not exercise in comparison with those exercised and this might attribute to the lower education level that affects the participant's knowledge of this concept [Figure 12]. The results show that exercise has proper effect on lowering blood glucose level of the diabetic participants [Figure 13]. Fourteen of diabetic participants were on healthy diet. While the non-diabetic persons this percentage is lower since most of the non-diabetic, patient's thoughts that they do not need to have diet restriction since they do not have diabetes yet [Figure 14].

About 42% of patients knew what kind of diet they must take [Figure 15]. This proportion was slightly lower than the patients who did not know about the diabetic diet. This greatly appears in Figure 16 that shows the effect of healthy diet on blood glucose [Figure 17]. About 52% answered that diabetic patients must avoid sweets to control blood glucose

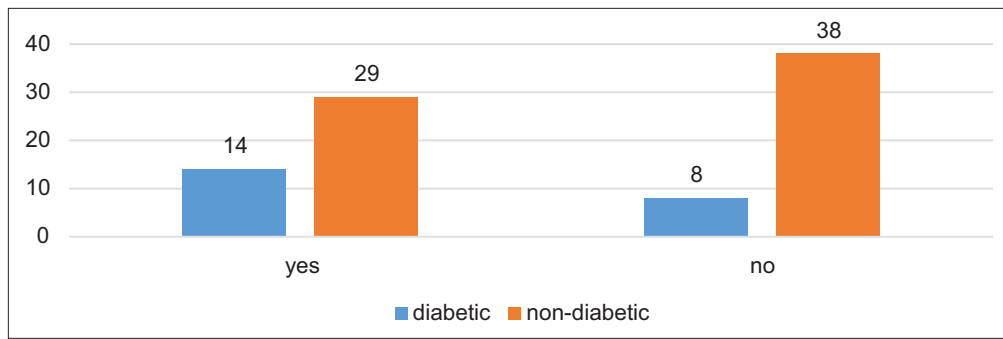


Figure 15: Knowledge of participants about if they having a healthy diet

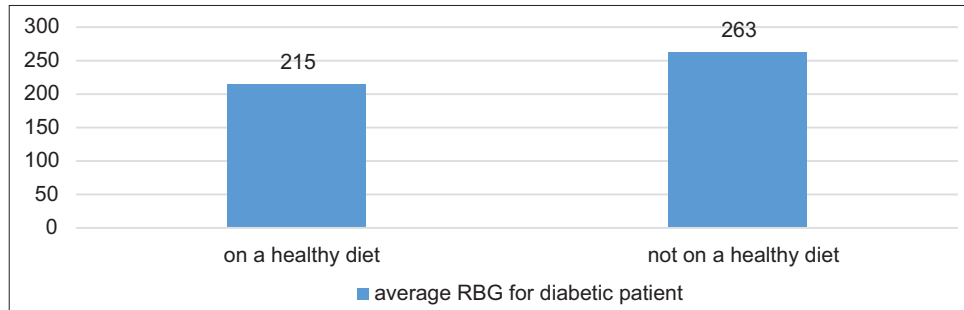


Figure 16: Effect of healthy diet on the average level of RBG of the studied population

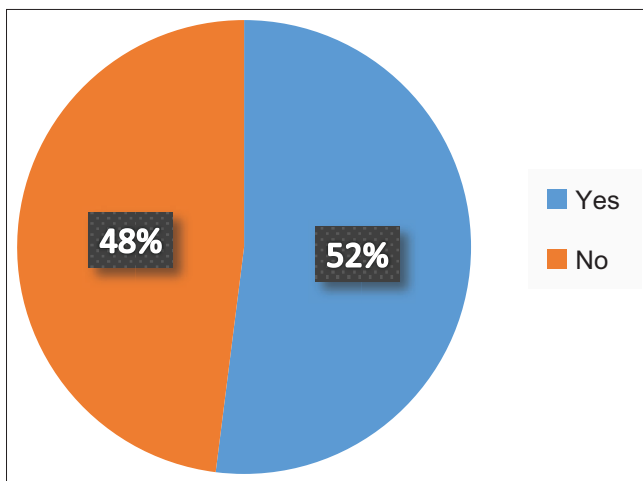


Figure 17: Knowledge of participants about avoiding sugar and sweets as the only measure to control diabetes

level; this might reveal the need for great efforts to enhance the patient counseling.

CONCLUSIONS

This study concludes that the diabetic patients showed a poor knowledge concerning the causes, prevention, and medications used in the management of diabetes. In addition, the study reveals very less number of patients received patient education. Patient education and counseling regarding disease, medication, and lifestyle modification for diabetic patients can greatly affect patient’s outcomes. These results indicate

the need for educational and counseling programs aimed to improve the knowledge of diabetes and role of nutritional therapy as one of the new approaches in controlling diabetes.

ACKNOWLEDGMENTS

We would like to express our thanks to Dr. Dawood Chalooob, Department of Clinical Laboratory Science, Basra College of Pharmacy. We are grateful to the most important people with diabetes in our study for their cooperation.

REFERENCES

1. Hunter JA. Davidson’s Principles and Practice of Medicine. 20th ed. Edinburgh: Churchill Livingstone, Elsevier Publications. 2006. p. 808.
2. International Diabetes Federation. IDF Diabetes Atlas. 6th ed. Brussels: IDF Diabetes Atlas; 2009. Available from: <http://www.idf.org>. [Last accessed on 2015 Apr 07].
3. Public Health Agency of Canada. Diabetes in Canada. Facts and Figures from a Public Health Perspective. Ottawa: Public Health Agency of Canada; 2011
4. Canadian Diabetes Association. The Cost of Diabetes. An Economic Tsunami: In Canada. Toronto, ON: Canadian Diabetes Association; 2009.
5. Kulkarni K, Castle G, Gregory R, Holmes A, Leontos C, Powers M, *et al.* Nutrition practice guidelines for Type 1 diabetes mellitus positively affect dietitian practices and patient outcomes. The diabetes care and education

- dietetic practice group. *J Am Diet Assoc* 1998;98:62-70.
6. Pi-Sunyer FX, Maggio CA, McCarron DA, Reusser ME, Stern JS, Haynes RB, *et al.* Multicenter randomized trial of a comprehensive prepared meal program in Type 2 diabetes. *Diabetes Care* 1999;22:191-7.
 7. Franz MJ, Monk A, Barry B, McClain K, Weaver T, Cooper N, *et al.* Effectiveness of medical nutrition therapy provided by dietitians in the management of non-insulin-dependent diabetes mellitus: A randomized, controlled clinical trial. *J Am Diet Assoc* 1995;95:1009-17.
 8. Cust G, Hodes C. A survey of knowledge of diabetes mellitus in the patients of a general practice. *J R Coll Gen Pract* 1967;13:313-20.
 9. Gulabani M, John M, Isaac R. Knowledge of diabetes, its treatment and complications amongst diabetic patients in a tertiary care hospital. *Indian J Community Med* 2008;33:204-6.
 10. Coast-Senior EA, Kroner BA, Kelley CL, Trilli LE. Management of patients with Type 2 diabetes by pharmacists in primary care clinics. *Ann Pharmacother* 1998;32:636-41.
 11. Khan LA, Khan SA. Level of knowledge and self-care in diabetics in a community hospital in Najran. *Ann Saudi Med* 2000;20:300-1.
 12. Badrudin N, Basit A, Hydrie MZ, Hakeem R. Knowledge, attitude and practices of patient visiting a diabetes care unit. *Pak J Nutr* 2002;1:99-102.
 13. Karki P, Baral N, Lamsal M, Rijal S, Koner BC, Dhungel S, *et al.* Prevalence of non-insulin dependent diabetes mellitus in urban areas of eastern Nepal: A hospital based study. *Southeast Asian J Trop Med Public Health* 2000;31:163-6.
 14. Wee HL, Ho HK, Li SC. Public awareness of diabetes mellitus in Singapore. *Singapore Med J* 2002;43:128-34.
 15. Baradaran HR, Knill-Jones RP, Wallia S, Rodgers A. A controlled trial of the effectiveness of a diabetes education programme in a multi-ethnic community in Glasgow [ISRCTN28317455]. *BMC Public Health* 2006;6:134.
 16. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, Kapur A, *et al.* Awareness and knowledge of diabetes in Chennai the Chennai urban rural epidemiology study [CURES-9]. *J Assoc Physicians India* 2005;53:283-7.
 17. McMurray SD, Johnson G, Davis S, McDougall K. Diabetes education and care management significantly improve patient outcomes in the dialysis unit. *Am J Kidney Dis* 2002;40:566-75.
 18. Moffat T. Point of care testing in the community pharmacy. *Pharm J* 2001;267:267-8.
 19. Pastors JG, Warshaw H, Daly A, Franz M, Kulkarni K. The evidence for the effectiveness of medical nutrition therapy in diabetes management. *Diabetes Care* 2002;25:608-13.
 20. Gaetke LM, Stuart MA, Truszczynska H. A single nutrition counseling session with a registered dietitian improves short-term clinical outcomes for rural Kentucky patients with chronic diseases. *J Am Diet Assoc* 2006;106:109-12.
 21. Imai S, Kozai H, Matsuda M, Hasegawa G, Obayashi H, Togawa C, *et al.* Intervention with delivery of diabetic meals improves glycemic control in patients with Type 2 diabetes mellitus. *J Clin Biochem Nutr* 2008;42:59-63.
 22. Huang MC, Hsu CC, Wang HS, Shin SJ. Prospective randomized controlled trial to evaluate effectiveness of registered dietitian-led diabetes management on glycemic and diet control in a primary care setting in Taiwan. *Diabetes Care* 2010;33:233-9.
 23. Robbins JM, Thatcher GE, Webb DA, Valdmanis VG. Nutritionist visits, diabetes classes, and hospitalization rates and charges: The urban diabetes study. *Diabetes Care* 2008;31:655-60.
 24. Vallis TM, Higgins-Bowser I, Edwards L. The role of diabetes education in maintaining lifestyle changes. *Can J Diabetes* 2005;29:193-202.
 25. Brekke HK, Jansson PA, Lenner RA. Long-term (1- and 2-year) effects of lifestyle intervention in Type 2 diabetes relatives. *Diabetes Res Clin Pract* 2005;70:225-34.
 26. Rickheim PL, Weaver TW, Flader JL, Kendall DM. Assessment of group versus individual diabetes education: A randomized study. *Diabetes Care* 2002;25:269-74.
 27. Glazier RH, Bajcar J, Kennie NR, Willson K. A systematic review of interventions to improve diabetes care in socially disadvantaged populations. *Diabetes Care* 2006;29:1675-88.
 28. Trento M, Basile M, Borgo E, Grassi G, Scuntero P, Trinetta A, *et al.* A randomised controlled clinical trial of nurse-, dietitian-and pedagogist-led group care for the management of Type 2 diabetes. *J Endocrinol Invest* 2008;31:1038-42.
 29. Gougeon R, Sievenpiper JL, Jenkins D, Yale JF, Bell R, Despres JP, *et al.* The transcultural diabetes nutrition algorithm: A Canadian perspective. *Int J Endocrinol* 2014;2014:12.
 30. Anderson TJ, Grégoire J, Pearson GJ, Barry AR, Couture P, Dawes M, *et al.* 2016 Canadian cardiovascular society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in the adult. *Can J Cardiol* 2016;32:1263-82.
 31. Mochari H, Gao Q, Mosca L. Validation of the MEDFICTS dietary assessment questionnaire in a diverse population. *J Am Diet Assoc* 2008;108:817-22.
 32. Béliard S, Coudert M, Valéro R, Charbonnier L, Duchêne E, Allaert FA, *et al.* Validation of a short food frequency questionnaire to evaluate nutritional lifestyles in hypercholesterolemic patients. *Ann Endocrinol (Paris)* 2012;73:523-9.
 33. Pullen C, Noble Walker S. Midlife and older rural women's adherence to U.S. Dietary guidelines across stages of change in healthy eating. *Public Health Nurs* 2002;19:170-8.
 34. van Lee L, Geelen A, van Huysduynen EJ, de Vries JH, van't Veer P, Feskens E. The dutch healthy diet index (DHD-index): An instrument to measure adherence to the dutch guidelines for a Healthy Diet. *Nutr J* 2012;11:49-57.

Source of Support: Nil. **Conflict of Interest:** None declared.