Research Article

CALCULATION THE RISK FACTORS FOR DEVELOPING TYPE 2 DIABETES AMONG AJMAN UNIVERSITY STAFF, AJMAN, UAE

Sawsan Shanableh [1]*, Alaa Faragallah [2], Sundos Qassim [1], Yassin Al-Hariri [2]

[1]Pharmaceutical Sciences Department, College of Pharmacy and Health Sciences, Ajman University, 346 Ajman, UAE
[2]Clinical Sciences Department, College of Pharmacy and Health Sciences, Ajman University, 346 Ajman, UAE
*Corresponding Author Email: s.shanableh@ajman.ac.ae

ABSTRACT

Objective: The aim of this study was to identify the risk of developing type 2 diabetes among Ajman University (AU) staff in the coming 10 years. Method: The Finnish Diabetes Risk Score (FINDRISC) questionnaire was used. This test is used to estimate the risk for developing Type 2 Diabetes in the next 10 years. It is a questionnaire-based survey. AU staff of both genders from different colleges and departments were invited to participate. A consent form signed by participants who accepted to be enrolled in this study. A Finnish Type 2 Diabetes Risk Score test (FINDRISC) was used to categorize the patients in to very high risk, high risk, moderate or low risk of developing diabetes within the next 10 years of life. SPSS version 24 was used in the data analysis. Results: Our results revealed that in the sample studied, the majority of the staff (42.30%) with high risk factors of having type 2 diabetes within 10 years while the minority (6%) with low risk factors of having type 2 diabetes within 10 years of life. Conclusion: The study findings emphasized the urgent need to implement national strategies to reduce the risk factors of type 2 diabetes. Conducting health education programs to increase the awareness about diabetes and how to manage the modifiable risk factors is the key to tackle the problem.

Key Words: Ajman University staff; Type 2 diabetes, Risk factor, Questionnaire survey, FINDRISC, BMI.

INTRODUCTION

Diabetes Mellitus is a serious, costly and major public health problem affecting millions of people worldwide[1]. The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs[2]. Moreover, it has a substantive economic impact on society with substantial direct and indirect costs[1].

According to International Diabetes Federation (IDF), in 2015, one out of every five people of the UAE population between the ages of 20 and 79 has type 2 diabetes at a rate of 19.3% of citizens and residents[3]. In 2015, the UAE was placed the 13th worldwide country having diabetes as there were over 1 million people living with diabetes in the UAE at that year and this number is expected to double to 2.2 million by 2040[4]. This is due to sedentary lifestyle, rapid economic growth and bad eating habits[4]. However, an increasing population and a greater understanding have also contributed to the increase in patients diagnosed with diabetes[4]. In 2008, the UAE ranked the 2nd highest worldwide for diabetes prevalence and in 2011, the IDF, put the UAE at number ten in the prevalence of diabetes worldwide and this improvement is due to the great efforts made by the ministry of health all over the country to fight the disease[5]. These efforts include public screening, awareness campaigns, training for health care providers, and awareness activities through colleges and local governments[5]. Diabetes Mellitus constitutes 75% of deaths among UAE nationals and 31% among non-nationals[1].

Several studies showed that only 19% of UAE's population gets sufficient amount of exercise, which is required to stay healthy, although it is known that stimulation of regular exercises associated with the significant reduction in the incidence of coronary events[6]. This is actually due to the fact that the extremely hot summer (June - September) makes a clear barrier to outdoor activities. But, even during the pleasant winter months (October - March), few people exercise on regular basis. It has estimated that slightly over 50% of males, and 39% of females, exercise regularly[7].

Most cardiovascular diseases like diabetes mellitus can be prevented by addressing risk factors[8]. There are evidences that effective modifying the risks factors can help in preventing CVDs[9]. Therefore, for identifying the number of undiagnosed diabetes as well as those at risk of developing diabetes, it is useful to use the risk factor scoring method[10]. This test will target individuals with three or four risk factors for diabetes[11]. Eventually this will help in decreasing the number of subsequent tests and thus minimizing the economic and personal costs of the screening strategy[12].

The aim of this study is to identify people at risk of developing type 2 diabetes within the next 10 years among Ajman University Staff, using a version of the Finnish Type 2 Diabetes Risk Score test (FINDRISC) [10,13].

MATERIALS AND METHODS

The Finnish Diabetes Risk Score (FINDRISC) questionnaire was used for screening people at high risk of developing Type 2 Diabetes[10,13]. This test is designed to measure a person's probability of developing type 2 diabetes over the following 10 years and it was used before in Finland and Libya[10,13].

A total number of 250 AU staff of both genders male and female were invited to participate in this study. Staff who were willing

to participate and complete data sets were included in the study. Staff who are unwilling to participate were excluded from the study. The questionnaire designed to be interview questionnaire to improve the response rate and to insure the measurement accuracy of the required data. The Finished Diabetes Risk Score test was composed of eight questions, which covers information about participant gender, age, weight, waist circumference, body mass index (BMI), physical activity, eating habits, and personal and family disease history (hypertension and diabetes).

Two pharmacists with proper skills were trained to carry out interviews with AU staff and measure their waist, weight and height. Comprehensive information about the nature of the study was supplied to each person and once they fully understood the implications of the study, they were asked if they would complete the questionnaire and sign the consent form of the study. Participants were assured that their responses would be treated confidentially and that their participation in the study would not affect their job position. The study was approved by Research Ethics committee (REC) of Ajman University and it was carried out over a three-month period (January to March2018).

Data Analysis

A descriptive study was conducted by using convenience sampling method. All data was analyzed by Statistical Package for the Social Sciences (SPSS, version 24 for Windows) computer program. Point scoring for different questionnaire items were conducted by referring to the instructions published in Finland study[13]. The scores of the test categorized the participants in to five groups: very high risk (total score > 20), high risk (total score = 15 - 20), moderate (total score = 12 - 14), slightly elevated (total score = 7 - 11) or low risk (total score < 7) of developing diabetes within the next 10 years of life.

Descriptive analysis included calculations of means and standard deviation for continuous variables. Frequencies and percent for categorical variables. P-value ≤0.05 was considered statistically significant.

RESULTS

Two hundred fifty of AU academic and nonacademic staff from different departments were invited to enroll in the current study. The response rate was 70% with a total number of 175 staff were willing to participate in this study.

Participants' age, waist and body mass index data

The majority of the sample were male (93, 53.1%) while the female participants was (82, 46.9%). Seventy two percent of the participants' age was under 45 years old (Figure 1). Most of the participants (45.70%) was categorized as over wright with body mass index (25-29.9) (Figure 2). Forty nine percent (49.50%) of men waist were less than 94CM (Figure 3) while for women the majority (59.80%) was with waist more than 88CM (Figure 4).

The prevalence of DM risk factors among participants

The main DM risk factor among participants for both male and female was low physical activity (69.7%), followed by having family history with diabetes (50.3%). Sixteen percent of participants using antihypertensive medications. The details of the participants' risk factors of developing diabetes within 10 years of life are listed in Table 1.

The score and categories of DM risk factors among participants

The mean (Standard Deviation) 10 years risk factors score of type 2 DM for the enrolled sample is 15.2400 (4.19354), while for women and men respectively is 16.1707 (4.56450), 14.41994 (3.66927).

The majority of the participants (42.30%) have high risk factors of having type 2 diabetes within 10 years of life while the minority of the participants (6%) have low risk factors of having type 2 diabetes within 10 years of life. Details listed in Figure 5.

DISCUSSION

The prevalence of type 2 diabetes is increasing in all populations worldwide. It is a major risk factor for death and numerous nonfatal complications that will form a large burden to the patients, their families, and the health care system[14]. Several recent studies have proved that type 2 diabetes can be efficiently prevented by lifestyle modification in high-risk individuals[14]. Therefore, Primary prevention of diabetes and its complications are important public health priorities.

The Finished Diabetes Risk Score is a simple, fast, inexpensive, noninvasive, and reliable tool to identify individuals at high risk for type 2 diabetes[10,13]. This risk factor approach needs aggressive identification for planning prevention strategies and for early diagnosis. Therefore, a diabetes risk score will help us to discover the burden of the disease and try to prevent it[15].

Our results showed that the participants have both modifiable and non-modifiable risk factors for developing diabetes within the next 10 years of life with different level of risk; very high risk, high risk, moderate, slightly elevated or low risk. The study showed that low physical activity, which is modifiable factor, is a main risk factor for developing type 2 diabetes with a 69.7% result. For that doing more physical activities can help in reducing the risk of having diabetes in the future. This result is consistent with the studies published before that confirmed increasing physical activity is useful in reducing the incidence of type 2 diabetes in high-risk individuals[16,17].

Family history is high level risk factor. Around half of participants (50.3%) has a positive family history, which is a very important non-modifiable risk factor that can provide important insight into the etiology of type 2 diabetes. Negative family history of diabetes may jointly reduce the risk of developing hyperglycemia and Type 2 diabetes in adults[17,18].

Other risk factor like lacking of taking fruits and vegetables daily was also positive in 24.6% of participants. Taking polysaccharide and Trans-fat meals associated with worse pancreatic β-cell function (BCF) and insulin resistance, whereas increased intake of fruits, vegetables and fibers were associated with better BCF[19].

In addition to previous risk factors, the results did show that 16% of participants were using antihypertensive medications and 11.4% have personal history of diabetes. Both of these factors increase the incidence of type 2 diabetes in the coming 10 years as it has revealed in other study that there is a tight link between hypertension and non-insulin-dependent diabetes[20].

The results of study also showed that men have high risk for developing type 2 diabetes more than women. Researchers revealed that men are biologically more susceptible to being

diagnosed with type 2 diabetes than women, which is same to our study result[21].

It is important to mention here, that the presence of one risk factor may not cause the disease, but it will increase the incidence of having it. Therefore, recognizing individuals with many risk factors can help in protecting them from having disease and its

microvascular and macrovascular complications in future[22]. For that, Current interventions for the prevention and reducing type 2 diabetes mellitus are those targeted towards modifying modifiable risk factors such as changing bad food habits and promoting physical activity.
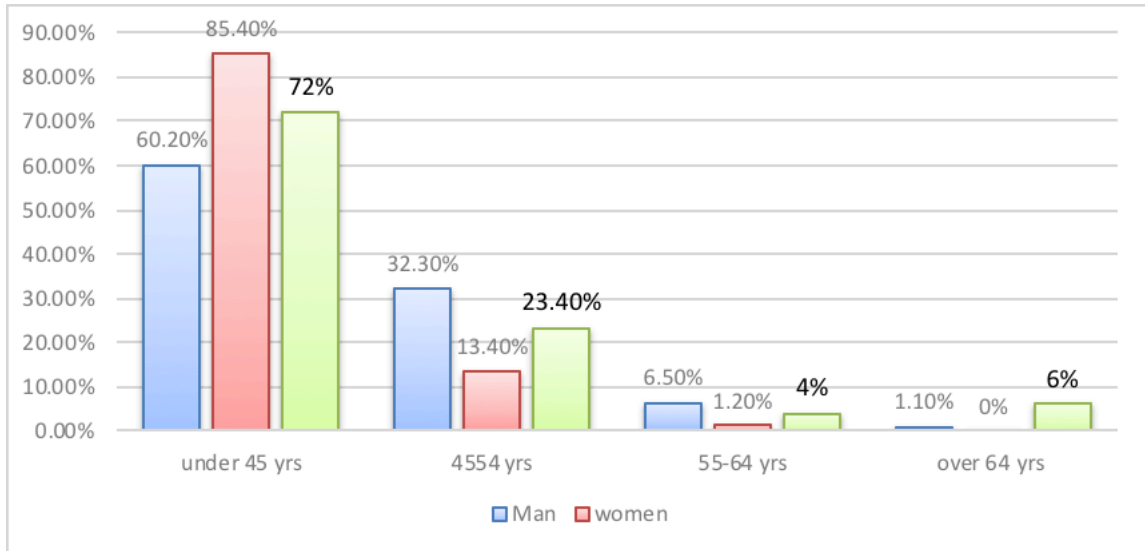
Figure 1: Age of participants. The range of age for all participants included in this study
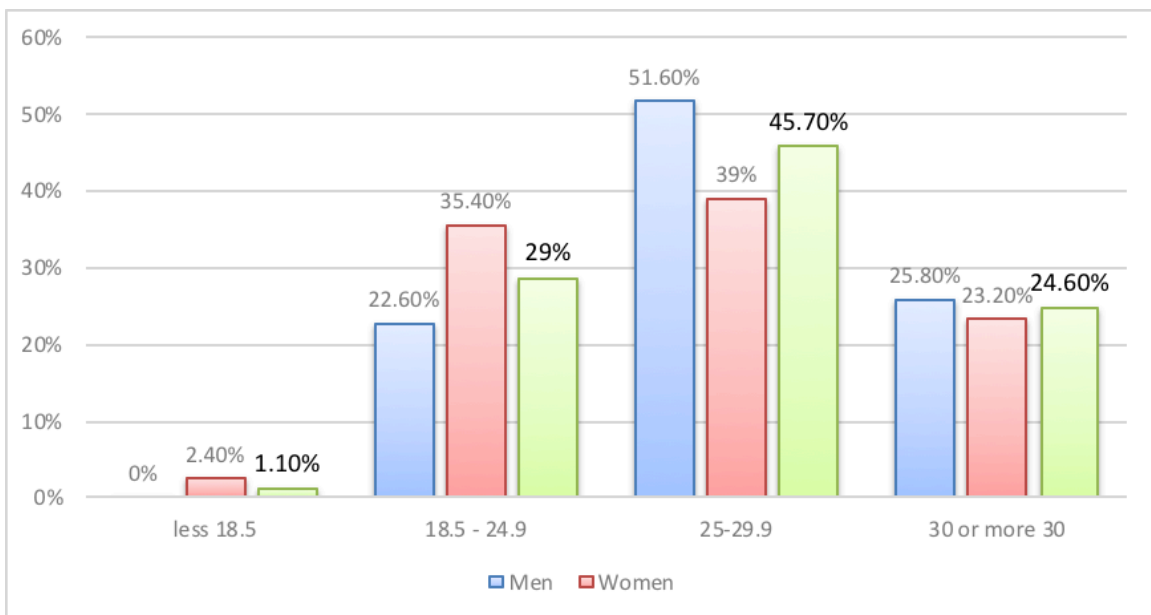

Figure 2: BMI of participants. The percentage of BMI for all men and women participants

Figure 3: waist of participants. The percentage of waist range for all participants
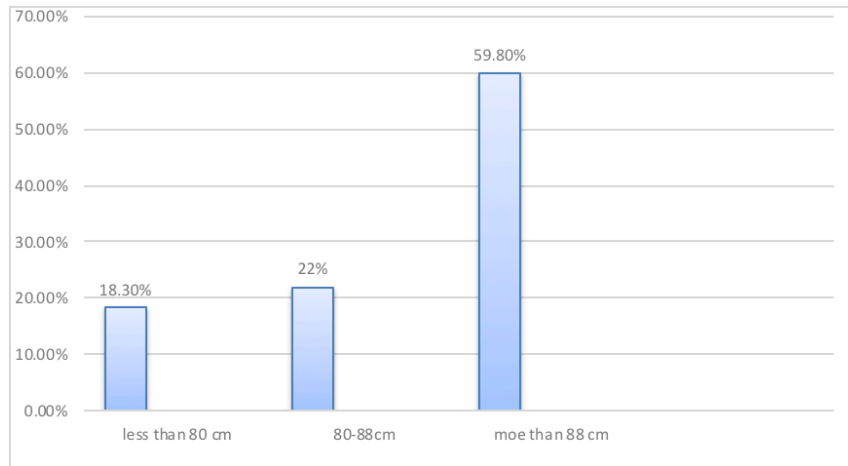

Figure 4: women waist. The percentage for waist range of all participants
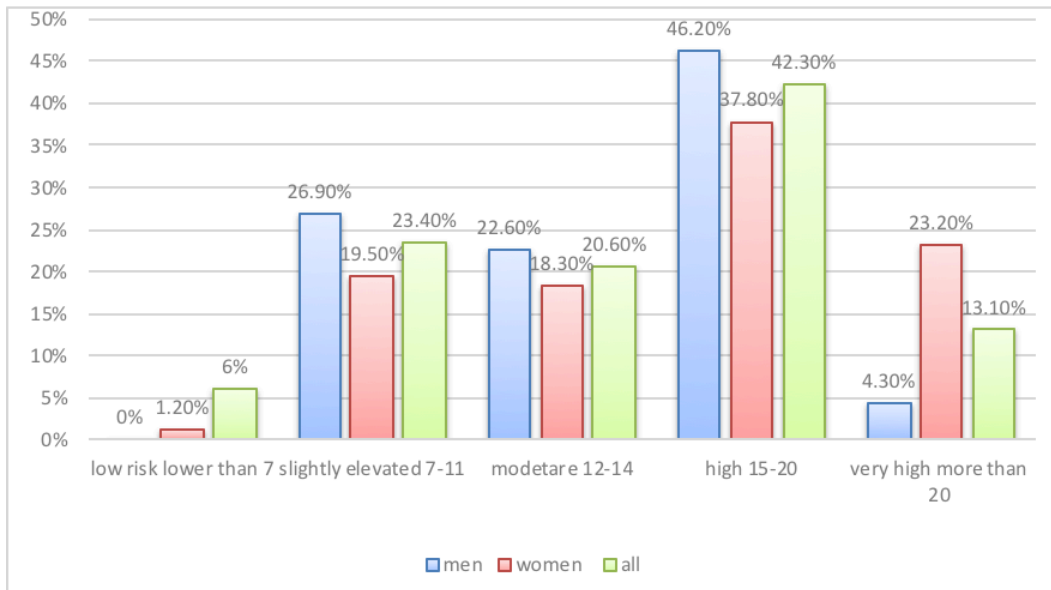

Figure 5: male and female risk factors categories of having type 2 diabetes within 10 years of life

Table 1: The prevalence of risk factors in the 175 participants of developing diabetes within their 10 years of life

Questions	All		Male		Female	
	Yes (N)%	**No (N)%**	**Yes (N)%**	**No (N)%**	**Yes (N)%**	**No (N)%**
Do you play physical activity at least 30min every day?	(53) 30.3%	(122) 69.7%	(35) 37.6%	(58) 62.4%	(18) 22%	(64) 78%
Do you eat vegetables and fruits every day?	(132) 75.4%	(43) 24.6%	(61) 65.6%	(32) 34.4%	(71) 86%	(11) 13.4%
Do you ever take HTN medication?	(28) 16%	(147) 84%	(19) 20.4%	(74) 79.6%	(9) 11%	(73) 89%
Have you been found high blood glucose level? (Or during pregnancy in case of women)?	(20) 11.4%	(155) 88.6%	(13) 14%	(80) 86%	(7) 8.5%	(75) 91.5%
Have any of your family member been diagnosed with diabetes?	(88) 50.3%	(87) 49.7%	(44) 47.3%	(49) 52.7%	(44) 53.7%	(38) 45.3%

CONCLUSION

Awareness of risk factors for developing type 2 diabetes will promote screening, early detection, and treatment in high-risk populations with the goal of decreasing both microvascular and macrovascular complications. Results from this study revealed that AU Staff has high risk for developing type 2 diabetes in the coming 10 years, so it will be useful if more education sessions about the disease and its complications are given to staff. As well, encourage them to do more physical activities and following healthy habits in their food and their life style.

LIMITATION

The major limitation of this study is the number of samples. The outcomes would have been more significant if the study was conducted on more numbers of AU staff.

ACKNOWLEDGMENTS

We are grateful to AU staff who had spent their valuable time in participating in this study and to pharmacists who help us in distributing the questionnaires to all participants.

REFERENCES

1. Shanableh S, Abdulkarem A, Shamssain M, Metwali Z, Sarhan F. Quality of life of diabetic patients on different types of antidiabetic medications. Int J Pharm Sci Res. 2015 Aug 1;35(40):41-50.
2. Narayan KV, Gregg EW, Fagot-Campagna A, Engelgau MM, Vinicor F. Diabetes—a common, growing, serious, costly, and potentially preventable public health problem. Diabetes Research and clinical practice. 2000 Oct 1;50:S77-84. https://doi.org/10.1016/S0168-8227(00)00183-2
3. Setrakian L. UAE and Diabetes: One in Four Has It. ABC news. Available at this website: http://abcnews. go. com/Health/Diabetes/Story. 2007.
4. El-Sharkawy T. Diabetes in the United Arab Emirates and other Arab Countries: need for epidemiological and genetic studies. Genetic Disorders in the Arab World: United Arab Emirates. Volume. 2004;1.
5. Imperial College London Diabetes Centre. 2018 [cited 2018 14/3/2018 Available from: http://www.icldc.ae/about-us/p/UAE-Diabetes-Trends-And-Numbers.(March, 2018)
6. Manson JE, Hu FB, Rich-Edwards JW, Colditz GA, Stampfer MJ, Willett WC, Speizer FE, Hennekens CH. A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. New England Journal of Medicine. 1999 Aug 26;341(9):650-8. https://doi.org/10.1056/NEJM199908263410904
7. McIlvenny S, DeGlume AM, Elewa M, Fernandez OT, Dormer P. Factors associated with fatigue in a family medicine clinic in the United Arab Emirates. Family Practice. 2000 Oct 1;17(5):408-13. https://doi.org/10.1093/fampra/17.5.408
8. World Health Organization. The world health report 2002: reducing risks, promoting healthy life. World Health Organization; 2002.
9. Organisation mondiale de la santé, World Health Organization. International Classification of Functioning, Disability, and Health: Children & Youth Version: ICF-CY. World Health Organization; 2007.
10. Abduelkarem AR, Sharif SI, Hammrouni AM, Aldouibi SS, Albraiki WM, El-Shareif HJ. Risk calculation of developing type 2 diabetes in Libyan adults. Practical Diabetes International. 2009 May;26(4):148-51. https://doi.org/10.1002/pdi.1359
11. Lawrence JM, Bennett P, Young A, Robinson AM. Screening for diabetes in general practice: cross sectional population study. Bmj. 2001 Sep 8;323(7312):548-51. https://doi.org/10.1136/bmj.323.7312.548
12. Shen H, Yu S, Xu Y. The use of risk factors scoring method in screening for undiagnosed diabetes in general population. Zhonghua liu xing bing xue za zhi= Zhonghua liuxingbingxue zazhi. 1999 Apr;20(2):114-7.
13. Saaristo T, Etu-Seppälä L. Prevention of diabetes and its complications: key goals in Finland. Diabetes Voice. 2006;6(4):13-7.
14. Lindström J, Tuomilehto J. The diabetes risk score: a practical tool to predict type 2 diabetes risk. Diabetes care. 2003 Mar 1;26(3):725-31. https://doi.org/10.2337/diacare.26.3.725
15. Joshi SR. Indian diabetes risk score. JAPI. 2005 Sep;53:755
16. Laaksonen DE, Lindström J, Lakka TA, Eriksson JG, Niskanen L, Wikström K, Aunola S, Keinänen-Kiukaanniemi S, Laakso M, Valle TT, Ilanne-Parikka P. Physical activity in the prevention of type 2 diabetes: the Finnish diabetes prevention study. Diabetes. 2005 Jan 1;54(1):158-65. https://doi.org/10.2337/diabetes.54.1.158
17. Xu F, Wang Y, Ware RS, Tse LA, Dunstan DW, Liang Y, Wang Z, Hong X, Owen N. Physical activity, family history of diabetes and risk of developing hyperglycaemia and diabetes among adults in Mainland China. Diabetic Medicine. 2012 May;29(5):593-9. https://doi.org/10.1111/j.1464-5491.2011.03495.x
18. Overvad K. The link between family history and risk of type 2 diabetes is not explained by anthropometric, lifestyle or genetic risk factors: the EPIC-InterAct study. Diabetologia. 2013;56(1):60-9. https://doi.org/10.1007/s00125-012-2715-x
19. den Biggelaar LJ, Eussen SJ, Sep SJ, Mari A, Ferrannini E, van Greevenbroek MM, van der Kallen CJ, Schalkwijk CG, Arts IC, Stehouwer CD, Dagnelie PC. Prospective associations of dietary carbohydrate, fat, and protein intake with β-cell function in the CODAM study. European journal of nutrition. 2018 Mar 10:1-2. https://doi.org/10.1007/s00394-018-1644-y

20. Tai TY, Chuang LM, Chen CJ, Lin BJ. Link between hypertension and diabetes mellitus epidemiological study of Chinese adults in Taiwan. Diabetes care. 1991 Nov 1;14(11):1013-20. https://doi.org/10.2337/diacare.14.11. 1013

21. TheDiabetesCouncil.Com. Gender Play – The Relationship Between Gender And Diabetes. 2018 13/3/2018]; Available from: https://www.thediabetescouncil.com/gender-play-the-relationship-between-gender-and-diabetes/. (March, 2018)

22. Fletcher B, Gulanick M, Lamendola C. Risk factors for type 2 diabetes mellitus. Journal of Cardiovascular Nursing. 2002 Jan 1;16(2):17-23. https://doi.org/10.1097/00005082-200201000-00003

Cite this article as: