European Online Journal of Natural and Social Sciences 2013;
Vol.2, No.2 Special Issue on Teaching and Learning.
ISSN 1805-3602

Diabetes Knowledge among people without diabetes living in Iran

Samereh Abdoli (corresponding author)
Assistant Professor of Nursing, Nursing and Midwifery Care Research Centre, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan- Iran.
samereh_abdoli@nm.mui.ac.ir
Maryam Tavana
Medicine student**,** Arak University of Medical Sciences, Arak- Iran

Financial support: The study was supported by Isfahan University of Medical Sciences (Grant NO: 191057)

Abstract

Understanding the specific needs of the real-world communities, according to population-based intervention is necessary. Along this way, in response to community needs and alongside community insight, exploring the knowledge of local people about diabetes is essential. This research is a descriptive study that involved 400 people without diabetes living in Isfahan (Iran). Sampling was done through classified sampling method. Data collection was done using questionnaire of knowledge of diabetes that consisted of five sections including general knowledge, risk factors, symptoms, and complications, management treatment and monitoring. Analyzing data was done by using descriptive and analytical statistics. The results showed that the average knowledge of diabetes based on 41 (28.73_ +0.37) which is above the average. In this regard, the average percentage of correct answers to the questions was more than 60%. In fact, the lowest percentage of correct answers were related to the definition of diabetes, the role of insulin in the body, pregnancy as a risk factor, heart attacks and strokes as late complications of diabetes and the possibility of urine glucose measurement at home by the people. However, the knowledge of diabetes of the people without diabetes has been reported higher than average. Therefore, diabetes pathophysiology, risk factors, late complications and how to monitor diabetes at home need to be enhanced in some areas.

Keywords: Knowledge of diabetes, people without diabetes, Iran

Introduction

Diabetes is growing among different populations (1). It is estimated that the number of people with diabetes by 2025 reach 300 million people and in 2030 would increase to 366 million people (2). In this regard, developing countries especially Asian countries have more proportion than others (3).

In Iran, among non-contagious disease, diabetes ranks first. It is estimated that 52% of the population of Iran have diabetes (4). Moreover, it is predicted that by 2025 it would increase to 6.8 % (5.1 million people). Evidence suggests that annually half a million is being added to the number of diabetics in the country. In other words, with 7% diabetes prevalence and 13% hidden diabetes among adults, approximately 20% of the population of Iran have diabetes or are susceptible to diabetes (2). However, the world is facing dramatic prevalence of diabetes, which mostly occurs in countries with low to moderate incomes (4). Complications impose reduced life expectancy, mortality caused by diabetes, high economic burden to individuals, families and to society as well (5).

Despite the individual, familial, social, economic burden of diabetes, evidence suggest that knowledge of diabetes and its risk factors can be a major factor in punctual diagnosis of diabetes, diabetes prevention, and correction of its adjustable factors. However, the effectiveness of interventions to prevent or delay the onset of diabetes and to reduce the risk of chronic complications has been proved (6-7). The successful transmission of these preventive strategies remains a major challenge in society health promotion (8-9). Understanding the specific needs of the real world is essential in every population-based intervention (10-11). In fact, the willingness of countries to design and to develop strategies for improving public health of diabetes and its risk factors is just like the design and implementation of appropriate care diagnostic managerial and therapeutic protocols in patients (12). Therefore, in response to this need, along with the insight of the community, it is necessary to assess knowledge of people about diabetes in targeted districts.

To do this, some studies showed that there is little public knowledge about diabetes. As an example, Maina et al (2010) in four provinces in Kenya found that only 29% of participants in the research were well aware about diabetes symptoms and its complications (12). Ulvi et al research in 2009 in Pakistan showed that rural communities are unaware of risk factors and complications of diabetes; in addition, the common reason of being aware of diabetes was that a family member of them had diabetes (13). In addition, various studies have reported poor knowledge about diabetes in public population of different areas of Iran such as Bushehr and Ahwaz (15-16).

Since, no research, which investigates the knowledge of people without diabetes about diabetes, had been conducted in Isfahan and community-based research requires assessing the knowledge of that area about diabetes; the present research conducted with aim to determine the level of public knowledge about diabetes. It is hoped that the findings of this research could be used as a guide for development of diabetes prevention programs in the country. The results of this research specify knowledge deficit related to diabetes in people without diabetes. In other words, it implies that those activities, which are being implemented in order to improve public health are available to public.

Methodology

This is a descriptive community-based research which assess the knowledge of public population about diabetes in Isfahan. The participants were people without diabetes over 20 years old, who were the residents at various municipal districts of Isfahan who were able to hear and to talk as well as willingness to participate in the research.

Because people of different areas may have different knowledge related to diabetes, classified sampling was used. Thus, based on municipal zoning, Isfahan was divided to 14 classes. To determine the required sample size of each class, proper allocation to size of that class was assigned.

According to the latest demographics, Isfahan includes 14 districts and has a total population of 1,791,069 people. Sample size of the present research was considered 400 people. After determining the sample size in each class, randomized sampling method was used for sampling. Thus, the researcher at different times of day visited the area and randomly sampling the sample size. In this research, in order to examine the knowledge of individuals without diabetes, the questionnaire including 41 questions on knowledge about diabetes was used. The questionnaire consisted of 5 domains of public knowledge of diabetes (8 questions), risk factors (4 questions), signs and symptoms (12 questions), control and treatment (13 questions) and diabetes monitoring (4 questions). The answer of each question is determined with the options of *yes, no and do not know*. Total score of questionnaire is 41 and the score of each area is based on the highest score of that area. Higher scores on this scale mean more knowledge in every area and in the entire questionnaire

as well. Questionnaire of knowledge about diabetes have been used by various researches for evaluating knowledge of public people about diabetes. The instrument was translated into Persian and in terms of compliance with original language; an expert fluent in both languages approved it. In addition to determining the content validity (with the participation of five experts in diabetes), its reliability was obtained by calculating Cronbach's alpha coefficient of (76%). Analyzing data was done by using descriptive and analytical statistics.

Ethical consideration

This research was approved by the ethics committee of Isfahan University of Medical Sciences. The purpose of the study and the voluntary nature of participation in the research were explained to the participants. All participants were assured on data confidentiality.

Results

Results of data analysis showed that a majority of participants (35.4%) were less than 27 years old. Most of them (64.1%) were males and 72.5% were married. Subjects with college education accounted for 39/6% of participants, and 55.6% were employed. For 48/2% of samples, family history of diabetes was negative and 60.1% of subjects were screened for diabetes [Table 1].

Table 1. Socio-demographic data of participants at the study

Socio-demographic data	(%)	NO
Age (32.5 ± .647)		
18-27	35.4	140
28-37	28.8	114
38-47	16.2	64
48-57	12.6	50
58-67	5.3	21
68-77	1.8	7
Gender		
Male	64.1	254
Female	35.9	152
Marital status		
Single	27.5	109
Married	72.5	287
Educational level		
Under diploma	22.5	89
Diploma	37.9	150
University	39.6	157
Employment status		
Unemployed	176	44.4
employed	220	55.6
Family history of diabetes		
Yes	48.2	191
No	51.8	205
Diabetes screening test		
Yes	60.1	238
No	39.9	158

The percentage of correct responses differs for each section: 35.4% to 89.1% (public knowledge), 46% to 82.3% (risk factors), 30.3% to 83.6% (signs and symptoms), 62.1% to 93.2% (treatment and control) and 27.8% to 94.4% (monitoring). The mean percentage of correct answers for public knowledge was (61.11%), risk factors (72.22%), signs and symptoms (65.15%), treatment and management (75.15%) and monitoring (75.75%) [Table 2].

Table 2. Percentage of correct answers to diabetes knowledge questionnaire in people without diabetes

Diabetes knowledge	Maximum percentage of correct answers	Minimum percentage of correct answers	Mean percentage of correct answers
General knowledge	83	22	61.11
Risk factors	91	31	72.22
Symptoms/complications	81	48	65.15
Treatment/Self Management	87	35	77.52
Monitoring	93	58	75.75

Mean scores of diabetes knowledge and mean score of areas of public knowledge, risk factors, signs and symptoms, control and treatment and monitoring in 2012 in Isfahan (Iran) showed that total mean diabetes knowledge of subjects (basis on 41) was 28.73 ±0.37. Mean score of population of Isfahan were public knowledge (4.89 ±0.08) (basis on 8), risk factors (2.88 ±0.05) (basis on 4), signs and symptoms (7.82±0.15) (basis on 12), treatment and management (10.09± 0.13) (basis on 13), and monitoring (3.03±0.04) (basis on 4), respectively [table 3].

Table 3. Mean knowledge score of diabetes in people without diabetes

Knowledge score	Maximum possible score	Mean±SD
General knowledge	8	4.8914 ±0.08642
Risk factors	4	2.8864±0.05255
Symptoms/complications	12	7.8283±0.15734
Treatment/Self Management	13	10.0934±0.13806
Monitoring	4	3.0354±0.04073
Mean total score	41	28.7348 ±0.37075

Comparison of overall mean score of knowledge of people of Isfahan about diabetes in 2012, based on personal characteristics showed a significant statistical relationship between total mean of knowledge and variables of age, sex, marital status, family history of diabetes, history of diabetes

screening tests. Individuals younger than 27 years old had the lowest score of diabetes knowledge while, the mean score of diabetes knowledge among females (unmarried), with a positive family history of diabetes and history of screening tests was greater than others [Table 4].

Table 4. Factors influencing total knowledge scores among people without diabetes

Socio-demographic factors	Mean total knowledge score	Statistical test
Age 18-27 28-37 38-47 48-57 58-67 68-77 >68	 26.37±0.569 30.13±0.58 30.35±0.89 29.54±1.132 32.00±1.09 22.85±5.22	K-W test 0.000(S)
Gender Male Female	 29.33±0.46 27.65±0.60	Mann-W test 0.008 (S)
Marriage status Single Married	 26.10±0. 70 29.73±0. 42	Mann-W test 0.000 (S)
Educational level Under diploma Diploma University	 28.94±0.82 28.79±056 28.56±0.64	K-W test 0.833(NS)
Family history of diabetes Yes No	 31.0524±0.45864 26.5756±0.53312	Mann-W test 0.000 (S)
Diabetes screening test Yes No	30.50±0. 39 26.06±0. 66	Mann-W test 0.000 (S)

Discussion

Findings of the present research showed that the overall mean scores is above average (28.73± 0.37). The results of Yun et al (2007) showed that the overall mean scores of people without diabetes of Malaysia about diabetes is 20.2 ± 5.97. They have stated that 55.8% of research participants had good to very good knowledge about diabetes (16). In addition, Wee et al (2002) demonstrated that knowledge of Singapore society about diabetes is acceptable except in some few areas (17). Furthermore, the results of Mohilden et al research (2011) in Saudi Arabia suggested that public knowledge of diabetes is good (18). Conversely, other researchers reported knowledge of people about diabetes in south of Iran low to moderate (14-15). Al- Shafe et al (2008) reported little public knowledge and understanding of semi-urban Omani about diabetes. They stated that 53.5% of people without diabetes could not provide a definition of diabetes (19). The results of Ulvi et al research (2009) and results of Gonzales et al (2009) in Latin countries showed that 63.3% of

participants did not have good knowledge about diabetes (13,20). In this regard, knowledge of the society of Kenya was reported poor (12).

The findings of the research showed that the mean percentage of correct answers in various areas including public knowledge of diabetes, risk factors, symptoms and side effects, treatment and monitoring was more than 60% in the population of Isfahan. More precisely, reported figures are as follows: public knowledge (61.11%), risk factors (72.22%), symptoms and side effects (65.15%), treatment and management (77.52%) and control (75.75%), respectively. The results are consistent with findings of Mohieldein et al (2011) in Saudi Arabia. The authors reported that 71.1% gave correct answers to questions of diabetes public knowledge while for risk factors and symptoms it was 71.1% and 63.4%, respectively. The lowest was in knowledge about side effects 47.7%, though in this regard the most common reported problem was eye problems (18).

The results of Wee et al 2002 research on knowledge of Singapore community about diabetes showed that percentage of correct responses varies for each section 22% to 83% (public knowledge), 31% to 91%(risk factors), 48% to 81% (symptoms and side effects), 35% to 87% (treatment and management) and 58% to 93% (monitoring) (17). In the present research, 60%, reported to have public knowledge about diabetes. However, low percentage of correct answers to questions about the pathophysiology of diabetes (34.6%), insulin function in the body (35.9%), pregnancy as a risk factor for diabetes (46%), heart failure (35.5%), and stroke (30.3%) as possible long-term complications of diabetes and urinary glucose measurements at home (27.8%) is important. Evidence suggests that limited information about pathophysiology, risk factors and less known complications of diabetes is not special to Iran. For example, participants in the research of Yun et al (2007) had less information about the pathophysiology of diabetes and difference between type 1 and type 2 diabetes (16). In the research of Daratha, Corbett, and Eylar (2009), participants referred to a type of long-term complications of diabetes. In addition, stroke and MI was known to be as complications of diabetes to 9.1% and 19.1% respectively (21). Ulvi et al research (2009) in Pakistan showed that awareness about diabetes risk factors was 14% and 22% about its complications (13). Al-Shafe et al (2008) described that 53.5% of Omani people without diabetes were not able to provide a definition of diabetes (19). In addition, more than two third of participants were unable to name obesity as a risk factor (13). Maina et al (2011) stated that only 29% of people in Kenya had good knowledge about the signs and symptoms of diabetes and a majority of them had little or no knowledge about diabetes (12). Results of various researches in India suggested that knowledge about risk factors and long-term complications of diabetes is limited (12, 22).

The results of the present research showed that occupation, education, and area of residence had no effect on the level of knowledge about diabetes, while knowledge of diabetes in singles, female, with positive family history of diabetes and history of screening test is more than others. In this way, by means of logistic regression test, it was found that, due to the share of variable of screening and family history of diabetes, the dependent variable is more knowledge about diabetes.

The results of Ulvi et al research (2009) showed that positive family history has a direct relationship with the amount of knowledge while education has no effects (13). On the contrary, the results of González et al (2009) research showed that in Latin countries higher levels of knowledge had a significant relationship with education (20). The results of Rani et al research (2008) in India showed that awareness of females were more than males (23) which are consistent with the present research. However, diabetes knowledge increases in people without diabetes in Saudi- Arabia had a direct relationship with male, old age, and higher education (13).

Conclusion

Although the results of the present research showed knowledge of public people of Isfahan society about diabetes is above average, the prevention of type 2 diabetes and its late complications in society requires developing educational interventions, based on community needs. Therefore, it seems that providing information about the pathophysiology and function of insulin in the body, pregnancy as a risk factor for diabetes, heart attacks, and strokes as late complications of diabetes and possibility to measure glucose at home can lead to an increase in the level of public knowledge.

Acknowledgment

This project was supported by Isfahan University of Medical Sciences (Grant No: 191057). Appreciation is expressed to all people without diabetes who participated in this study.

References

1. International Diabetes Federation (2006). *Unite For Diabetes*. Available at http// petiton.unitefordiabetes.org/from.php. Visited at 1.1.2007
2. Wild, S., Roglic, G., & Green, A. (2004). Global prevalence of diabetes, estimates of the year 2000 & projections for 2030. *Diabetes Care,* 27(5) 1047-1051.
3. King H, Aubert R.E, & Herman W.H. (1998). Global burden of diabetes 1995-2025, prevalence, numerical estimates and projections. *Diabetes Care,* 21(9) 1414-1431.
4. Azizi, F. (2005). Diabetes care and prevention in Iran**.** *Diabetes Voice*, 50(4) 15-17.
5. Hogan. P, Dall T, & Nikolov P. (2003). Economic costs of diabetes in the U.S in 2002. *Diabetes Care,* 26(3) 917-932.
6. Knowler, W.C., Barrett-Connor, E., Fowler, S.E. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 346,393-403.
7. Laffel, L.M.B., McGill, J.B., & Gans, D.J. (1994). The beneficial effect of angiotensin-converting enzyme inhibition with captopril on diabetic nephropathy in normotensive IDDM patients with microalbuminuria. North American Microalbuminuria Study Group. *Am J Med,* 99, 497-504.
8. Venkat-Narayan, K.M., Gregg, E.W., Engelgau, M. M. 2000). Translation research for chronic disease. The case for diabetes. *Diabetes Care*, 23,1794-1798.
9. Glasgow, R.E.,Wagner, E., Kaplan, R.M. (1999). If diabetes is a public health problem, why not treat it as one? A population-based approach to chronic illness. *Ann Behav Med*, 21,159-170.
10. Bowman BA, Gregg EW, & Williams DE (2003). Translating the science of primary, secondary, and tertiary prevention to inform the public health response to diabetes. *J Public Health Manag Pract*. 9(suppl), 8-14.
11. Jack L Jr, Liburd L, & Spencer T. (2004). Understanding the environmental issues in diabetes self-management education research: A re-examination of 8 studies in community-based settings. *Ann Intern Med*, 140, 964-971.
12. Maina WK, Ndegwa ZM, Njenga EW, & Muchemi EW (2010). Knowledge, attitude and practices related to diabetes among community members in four provinces in Kenya: a cross-sectional study. *Pan African Medical Journal*, 7, 2.
13. Ulvi OS, Chaudhary RY, Ali T, Alvi RA, Aman Khan MF, & Khan M (2009). Investigating the awareness level about Diabetes Mellitus and associated factors in Tarlai (Rural Islamabad). *J Pak Med Assoc*, 59(11), 798-801

14. Babaie Gh, Soltanian A, Khakhali H, Rabieian M, Bahreini F, & Ardakani M. (2006). Assess diabetes knowledge and its complications in Adult over 18 years old living in Bousher based on linear models. *Journal of payavard-e- salamat.* 1(1), 52-58 (Persian).
15. Rashidi H, Shahbazian H, Latifi M, & Ghasemi M. (2010). Assess public diabetes knowledge in Ahwaz. *Journal of Medical Science*, 9(5); 449-56 (Persian).
16. Yun LS, Hassan Y, Aziz NA, Awaisu A, & Ghazali R. (2007). A comparison of knowledge of diabetes mellitus between patients with diabetes and healthy adults: A survey from north Malaysia. *Patient Education and Counseling,* 69, 47-54.
17. Wee HL, Ho HK, & Li SC (2010). Public awareness of diabetes mellitus in Singapore. *Indian Journal of Physiotherapy and Occupational Therapy*. 4(1), 24-28.
18. Mohieldein AH, Alzohairy MA & Hasan M (2011). Awareness of diabetes mellitus among Saudi nondiabetic population in Al-Qassim region, Saudi Arabia. *Journal of Diabetes and Endocrinology*, 2(2): 14-19
19. Al Shafaee MA, Al-Shukaili1 S, Rizvi SGA, Farsi YA, Khan MA, SS Ganguly, Afifi M & Adawi SA (2008). Knowledge and perceptions of diabetes in a semi-urban Omani population. *BMC Public Health*, 8, 249. http://www.biomedcentral.com/1471-2458/8/249
20. González, HM, Vega, WA, Rodríguez, MA, Tarraf M, & Sribney, WM. (2010). Diabetes Awareness and Knowledge Among Latinos: Does a Usual Source of Healthcare Matter? *J Gen Intern Med* , 24(Suppl 3), 528–33
21. Daratha KB, Corbett CF, & Eylar J. (2009). Awareness of Diabetes-Related Complications in a Community Survey. *Washington State Journal of Public Health Practice*. 2009, 2(1).
22. Deepa M , Pradeepa R , Rema M , Anjana M , Deepa R , & Shanthirani S (2003). The Chennai Urban Rural Epidemiology Study (CURES) – Study Design and Methodology (Urban Component) (CURES-1). *J Assoc Physicians India*, 51, 863-70.
23. Rani PK , Raman R, Subramani S, Perumal G, Kumaramanickavel G. G. & Sharma G. (2008). Knowledge of diabetes and diabetic retinopathy among rural populations in India, and the influence of knowledge of diabetic retinopathy on attitude and practice, *Rural and Remote Health (Online)*, 8, 838. Available at http://www.rrh.org.au