Bulletin of Pure and Applied Sciences
Vol.39A (Zoology), No.1,
January-June 2020: P.82-87
Original Research Article

Print version ISSN 0970 0765
Online version ISSN 2320 3188
DOI 10.5958/2320-3188.2020.00010.8
Available online at www.bpasjournals.com

Survey of awareness of diabetes mellitus (Type-2) among Muzaffarpur Population, Bihar

[1]Rashmi Rekha*
[2]Usha Kumari

Author's Affiliation:
[1]Department of Zoology, Research scholar, Mahant Darshan Das Mahila Mahavidyalaya, B.R.A.B.U Muzaffarpur, Bihar 84002, India.
[2]Department of Zoology, Associate professor & HOD, Mahant Darshan Das Mahila Mahavidyalay, B.R.A.B.U. Muzaffarpur, Bihar 84002, India.

***Corresponding author:**
Rashmi Rekha
Department of Zoology, Research scholar, Mahant Darshan Das Mahila Mahavidyalaya, B.R.A.B.U Muzaffarpur, Bihar 84002, India.

E-mail: asmitvibhu@gmail.com

Received on 09.01.2020
Accepted on 07.04.2020

Abstract:
***Background*:** Diabetes mellitus (DM) is reported as one of the hazardous diseases rising at a very fast rate. One of the major reasons behind this is the lack of knowledge and awareness among the people. Increase in knowledge and complications regarding diabetes among people expected to have a better outcome of the disease. This study was planned to assess the awareness about diabetes.
Methods: This study was conducted in the urban area of Muzaffarpur city located in Bihar. This study was a community-based cross-sectional study and includes 600 participants randomly selected from different age groups. Demographic data and knowledge of participants on various aspects of DM were collected by a well-prepared questionnaire. Descriptive statistics were used for data analysis.
Result: It was found that 39.83% of participants had knowledge of DM. Only 9% of subjects were graduate or highly educated. This percentage reflects the low prevalence of diabetic knowledge in society. Only 10.67% knew that DM was caused by insufficient insulin. 73.67% of respondents did not know any DM symptoms. 61% of respondents did not know how this disease can be prevented. 88.33% of respondents did not have any idea about the complication of DM.
Conclusion: This study indicated that awareness about diabetes was very poor, especially in subjects with low education. The study concluded that there is an urgent requirement of different strategies like diabetic health campaigns, issuing pamphlets of information about DM, public speaking sessions, etc to spread awareness among the general population.

Keywords: Type2 DM; Prevention and management; Risk factors; awareness

INTRODUCTION

Some 425 million people worldwide, or 8.8% of adults 20-79 years, are estimated to have type-2 diabetes mellitus (DM). The number of people with diabetes increases to 451 million if the age is expanded to 18-99 years. If these trends continue, by 2045, 693 million people 18-99 years, or 629 million people 20-79 years, will have diabetes.[1] In 2016, an estimated 1.6 million deaths were directly caused by diabetes. Almost half of all deaths attributable to high blood glucose occur before the age of

70 years. WHO estimates that diabetes was the seventh leading cause of death in 2016.[2] Nearly 80% of diabetes deaths occur in low and middle-income countries.[3] India is diabetes capital with home to 69.1 million people with DM, the second-highest number of cases after China.[4] According to Wild *et al* the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India.[5] In Bihar according to conservative figures, 2.8%-4.1% adult population in the state suffers from diabetes. In urban areas, the incidence is as high as 3.5 to 4 percent. The problem is getting more serious by the day as more and more young people are being diagnosed with the disease.[6] Knowledge and awareness about diabetes in India, particularly in rural areas, are poor. Only 43.2% of the population had heard about a condition called diabetes. Overall urban residents had higher awareness rates (58.4%) compared to rural residents (36.8%).[7] Increasing knowledge regarding diabetes and its complications has significant benefits including an increase in compliance to treatment, thereby decreasing the complications associated with diabetes.[8,9] Increasing patient knowledge regarding diabetes and its complications would help them to assess their risks, motivate to seek proper care and treatment. Compliance of patients will also increase and thereby it decreases the complications associated with the disease.[10] There is very little data on the level of awareness and prevalence of diabetes in developing countries like India.[11] This article focused on the awareness and knowledge of various aspects like symptoms, treatment, complications, preventive measures of diabetes mellitus (type-2) among the population of the Muzaffarpur, Bihar.

MATERIAL AND METHODS

This study was conducted in the urban area of Muzaffarpur city located in Bihar. It was done from August 2018 to January 2020. It was a community-based cross-sectional study and includes male and females from different age groups (more than 20 years) from different areas. We took random samples from the participants chosen from door to door visits, among them 252 were male and 348 were female. Demographic data of subjects were recorded by filling a questionnaire covering the following parts: age, gender, family history, residence, education level, types of physical activities, and duration of illness if anyone suffering from diabetes, knowledge about diabetes, its cause, complications and preventive measure of diabetes mellitus. A total of 600 samples were collected. Data were analyzed by SPSS version 15. Descriptive statistical analyses were done for data analysis. The name of participants was not included in questionnaires and all the personal information obtained from participants was kept confidential.

RESULTS

This was a cross-sectional study of 600 participants more than 20 years of age were randomly selected from Muzaffarpur district situated in Bihar, India.

Table1: Age distribution and educational level

Categories		**Number (Total=600)**	%
Sex	Female	348	58
	Male	252	42
Education level	Illiterate	130	21.67
	10^{th}	276	46
	12^{th}	140	23.34
	Graduates and more	54	9

Table 1 shows the general characteristics of 600 participants in which 348 participants were female (58%) and 242 were male (42%). Most of them (46%) had completed their secondary studies, 23.34% completed their higher secondary studies and 21.67% were illiterates. Those who had not completed their study at matriculation level were considered illiterate. Only 9% of people were found to be graduate or postgraduate.

Table 2: lifestyle of Participant and diabetes related questionnaires

Categories	Answer of Participants	Number	%
Suffering from DM	yes	30	5
	No	570	95
Duration of having DM	<1	4	0.67
	1-5	11	1.83
	6-10	7	1.17
	>10	8	1.34
Regular checkup	yes	22	3.6
	No	578	96.34
Exercise	Regular walking	62	10.33
	Regular walking + exercise	22	3.6
	Only exercise	13	2.16
	No exercise	503	83.33
Family history of DM	Yes	85 (15 DM)	14.16
	No	515	85.83
Knowledge about DM	Yes	239	39.83
	No	361	60.17
Participants idea about DM	Increase sugar in blood	143	23.83
	Low Insulin secretion	64	10.67
	Excess sweet eating	32	5.33

Table-2 shows the percentage of participants suffering from diabetes mellitus and related questionnaires of their daily life. Prevalence rate of DM in this region was found 5%.Only 3.6% of participants visited doctors for their regular checkups. 83.33% of participants did not do any type of exercise. 10.33% went for a walk regularly. Only 3.6% of people used to walk and exercise too. 2.16% of respondents exercised daily. 14.16% of all participants had a diabetic family history. Among which 50% of diabetic patients had a positive family history. 39.83% of participants had knowledge about diabetes mellitus; among which the majority of respondents (23.83%) knew that in diabetes blood sugar level increased from normal level. 10.67% of people knew about hormone insulin and their relation to diabetes. 60.17% of participants had no idea about DM but they know that it is a type of disease.

Table 3: Knowledge of participants about Diabetes mellitus

Categories	Answer of Participants	Number	%
Symptom of DM	Thirst and frequent urination	105	17.5
	Thirst, frequent urination, increase appetite	29	4.83
	Thirst, frequent urination, increase appetite, weight loss, blurred vision	18	3
	Thirst, frequent urination, increase of appetite, weight loss, blurred vision, poor wound healing	6	1
	No any knowledge	442	73.67
Complications	Retinopathy (loss/diminished vision)	19	3.16
	Cardiovascular disease (Heart attack, stroke)	29	4.83
	Renal failure	6	1
	Neuropathy (numbness, tingling sensation, weakness)	13	2.2
	Know about all or some complications	3	0.5
	No Knowledge	530	88.33

Knowledge of participant about symptoms and complication of DM were summarized in Table-3. The majority of participants (73.67%) had not any idea about DM symptoms. When we asked about DM symptoms, most of participant's (17.5%) answer was thirst and frequent urination, 4.83% knew about increase in thirst, increase in appetite and frequent urination. Only 1% of the participants having sufficient knowledge of symptoms of DM. 88.33% of responders had no knowledge about any DM complication. 3.16% knew that DM could result in retinopathy, 4.83% knew about cardiovascular disease is one of the complication, 1% knew about renal failure, 2.2% knew about neuropathy and only 0.5% of respondents knew about more than one complication.

Table 4: Participant Knowledge about risk factors and management and prevention of diabetes

Categories	Answer of Participants	Number	%
Knowledge of risk factors of DM	Positive family history	30	5
	Tobacco and alcohol consumption	26	4.34
	obesity	46	7.67
	Hypertension	10	1.67
	Psychological stress	25	4.17
	Sedentary life-style	24	4
	Mixed	33	5.5
	Not known	442	73.66
Treatment (knowledge)	Medication	257	42.83
	Healthy diet	104	17.34
	Medication + Healthy Diet	113	18.83
	Medication + Healthy Diet + Exercise	126	21
DM preventive measure (knowledge)	Low carbohydrate and low salt diet (avoid sugar)	139	23.16
	Exercise (weight loss)	37	6.16
	No smoking, alcohol consumption, tobacco consumption	15	2.5
	Keep Normal Blood Pressure	10	1.66
	Mixed	33	5.5
	Not Known	366	61

Table -4 shows knowledge of participants about risk factors, treatment and preventive measures of DM. 73.66% of participants had no knowledge about any risk factors of DM. 7.67% of participants thought that obesity was the major risk factor.4.3% knew about tobacco and alcohol consumption, 1.67% knew about hypertension, 4.17% knew about psychological stress, 4% knew about sedentary life-style was risk factor. 5.5% of respondents had knowledge of more than one risk factor. 5% thought that if parents had diabetes then their children may develop DM. 42.83% of participants believed that medication was only treatment of diabetes and a small percentage (21%) of participants knew that the treatment of DM was a combination of medication, healthy diet and exercise. 23.6% of participants thought that consumption of a low carbohydrate diet was one of the preventive measures but 61% had no idea about any preventive measure.

DISCUSSION

This study was done to access the awareness of diabetes mellitus in the Muzaffarpur region situated in Bihar. Most of the people in that societies were illiterate (21.67%) or less educated (69.34%). A large population had heard about diabetes but its symptoms, complication, risk factors, and treatment known only to a few. In this study, we find that only 39.83% of participants knew about diabetes. When compared with the study of C. Munninarayana found 50.8% awareness in population of Kolar and Deepa M.[12] were found 75.5% awareness in the population of Chennai.[7] Therefore it needs to

improved awareness among people of rural and urban India. Even very few percentages of educated groups were fully aware of this disease. A total of 600 participants (252male and 348 female) were chosen randomly. Only 9% were highly educated (graduate or more). The prevalence of diabetes in the Muzaffarpur region was found to be 5%. In a survey, it was found that only 2.8-4% population of Bihar suffering from DM.[13] our survey reflects that the occurrence of DM in Bihar is in rising condition. The objective of this study was to survey the awareness of DM in this region and convey a message to the government and society that how many people were aware of such a hazardous epidemic disease. In a study by S. B. Aynalem *et al* prevalence of DM was found 6.5% which was closer to our finding. The overall prevalence of diabetes was associated with education; those with least educated exhibiting highest prevalence (10.2%) and those with at least a bachelor's degree the lowest (3.4%).[14] This data simply shows that educated people were more aware of any disease than the least educated and the present study showed the percentage of high education was very low (9%) that's why the percentage of awareness for DM was also found low (60.17%). The data of highly educated people was found very low as compared to a study done in the Arar population (14%) of Saudi Arabia, where the percentage of higher education was 77.8%.[15] Only 3.6 % of participants were concern about their health and visited to doctor for a regular checkups. Abdelmarouf observed in his study that the knowledge of risk factors and symptoms of DM was 63.4 and 80.8% respectively.[16] which was a contrast of this study where only 26.34% of participants had knowledge of risk factor and only 26.27% had knowledge of symptoms of DM. Most people had hardly any knowledge of one risk factor (20.84%); only 5.5% knew more than one risk factor. 17.5% responders knew that the most common symptom of diabetes mellitus was an increase in thrust and frequent urination. This finding was found more as compare to the study of Jackson DM (4%).[17] Only 10.67% knew that DM was caused by insufficient insulin which was nearly similar to finding (6.5%) of Foma MA who studied in the Gambia.[18] 14.16% of participants had a family history of diabetes mellitus and mostly it was found that they were more aware of DM. 16.67 % respondents do daily walking or other physical exercise and only 6.16% knew that exercise was a preventive measure of DM. Most of the participants had only known that it was a type of disease and may be treated by medication (42.83%). This result was found similar (43.2%) as study of M. Deepa *et al.*[7] 23.16% of respondents knew that eating a low carbohydrate diet was one of the preventive measures. According to the Chennai urban rural epidemiology study, only 19.0% of the total population were aware that DM could produce some complications which is similar to our finding (11.67%).[19]

CONCLUSION

This survey reflects poor knowledge and awareness of diabetes mellitus in our studied population. Nowadays diabetes is a growing disease and its prevalence rate is in rising condition. There are some risk factors like obesity, tobacco, alcohol consumption, smoking, less physical activity, psychological stress, etc should be modifiable. If people concern and aware of this, it becomes easy to reduce the rate of prevalence of diabetes mellitus. There is an urgent requirement of different strategies like diabetic health campaigns, issuing pamphlets of information about DM, public speaking sessions, etc to spread awareness among the general population.

REFERENCES

1. International Diabetic Federation (IDF) atlas 8th edition (2017).
2. World Health Organization/ Fact-sheet/ 30 october 2018
3. Buse, J.B., Polonsky, K.S. and Burant, C.F. () Type 2 diabetes mellitus. In: Kronenberg, H.M., Melmed, S., Polanski, K.S., Larsen, P.R., Eds., William's Textbook of Endocrinology,12th edition, Saunders, Philadelphia,2011, p.1371-1435.
4. Tripathy, J.P., Thakur, J.S., Jeet, G. *et al*. Prevalence and risk factors of diabetes in a large community-based study in North India: results from a STEPS survey in Punjab, India. *Diabetol Metab Syndr* 9, 8 (2017) doi:10.1186/s13098-017-0207-3
5. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes-estimates for the year 2000 and projections for 2030. Diabetes Care. 2004;27(3):1047–53

6. Kanungo S, Mahapatra T, Bhowmik K, Mahapatra S, Saha J, et al. (2016) Diabetes Scenario in a Backward Rural District Population of India and Need for Restructuring of Health Care Delivery Services. Epidemiol 6:224.doi:10.4172/2161-1165.1000224
7. Deepa M, Bhansali A, Anjana RM, et al. Knowledge and awareness of diabetes in urban and rural India: The Indian Council of Medical Research India Diabetes Study (Phase I): Indian Council of Medical Research India Diabetes 4. *Indian J Endocrinol Metab*. 2014;18(3):379–385. doi:10.4103/2230-8210.131191
8. Visser A, Snoek F. Perspectives on education and counseling for diabetes patients. Patient Educ Couns. 2004; 53:251–5.
9. Rani PK, Raman R, Subramani S, Perumal G, Kumaramanickavel G, Sharma T. Knowledge of diabetes and diabetic retinopathy among rural populations in India, and the influence of knowledge of diabetic retinopathy on attitude and practice. Rural Remote Health. 2008;8:838
10. 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;3:204-6
11. Ramachandran A, Snehalatha C, Baskar AD, Mary S, Kumar CK, Selvam S, et al. Temporal changes in prevalence of diabetes and impaired glucose tolerance associated with lifestyle transition occurring in the rural population in India. Diabetologia. 2004
12. Muninarayana C, Balachandra G, Hiremath SG, Iyengar K, Anil NS. Prevalence and awareness regarding diabetes mellitus in rural Tamaka, Kolar. *Int J Diabetes Dev Ctries*. 2010;30(1):18–21. doi:10.4103/0973-3930.60005
13. Kanungo S, Mahapatra T, Bhowmik K, Mahapatra S, Saha J, et al. (2016) Diabetes Scenario in a Backward Rural District Population of India and Need for Restructuring of Health Care Delivery Services. Epidemiol 6:224.doi:10.4172/2161-1165.1000224
14. Borrell LN, Dallo FJ, White K. Education and diabetes in a racially and ethnically diverse population. *Am J Public Health*. 2006; 96(9):1637–1642. doi:10.2105/AJPH.2005.072884
15. Alanazi AM, Abo El-Fetoh NM, Alotaibi HK, et al. Survey of awareness of diabetes mellitus among the Arar population, Northern Border Region of Saudi Arabia. *Electron Physician*. 2017;9(9):5369–5374. Published 2017 Sep 25. doi:10.19082/5369
16. Abdelmarouf, Hassan & Mohieldein, & Alzohairy, Mohammad & Hasan, Marghoob. (2011). Awareness of diabetes mellitus among Saudi non-diabetic population in Al-Qassim region, Saudi Arabia. Journal of Diabetes and Endocrinology. 2. 14-19.
17. Jackson DM, Wills R, Davies J, Meadows K, Singh BM, Wise PH. Public awareness of the symptoms of diabetes mellitus. *Diabet Med*. 1991;8(10):971–972. doi:10.1111/j.1464-5491.1991.tb01540.x
18. Foma MA, Saidu Y, Omoleke SA, Jafali J. Awareness of diabetes mellitus among diabetic patients in the Gambia: a strong case for health education and promotion. *BMC Public Health*. 2013; 13:1124. Published 2013 Dec 5. doi:10.1186/1471-2458-13-1124
19. 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.