



Original Research Article

Study of dietary pattern, and lifestyles among Type-2 diabetic patients

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ABSTRACT

Introduction: In 21st century diabetes is one of the most challenging health problems. According to IDF diabetes Atlas 9th edition 2019, estimates approximately 463 million adults 20-79 years age group are with diabetes and by 2045, nearly 700 million adults is expected to have diabetes. Risk factors like age, sex family history, physical activity, BMI, dietary pattern were assessed to find their association with diabetes.

Materials and Methods: A community based cross-sectional study was conducted during February to March 2019 among 100 respondents of 30-60 years of age group in Deoria and Karaundi Varanasi. Out of which 54 female and 46 male were interviewed by using pretested semi- structured interview. Pregnant women and patients with type 1 diabetes were excluded from the study.

Result: In the present study maximum 43% study subjects were in the age group of (40-50) years. Most of the patients were housewife that is 35%. Most common complication is ophthalmic like retinopathy, cataract and blur vision in 43% respondents and 54% respondents have diabetes since less than 5 years. By the reveal information about medical behavior out of the total respondents 24% were dependent upon insulin and remain 76% were not taking insulin. 65% respondents were regularly checking their blood glucose level and 35% were not checking regularly.

Conclusion: The study shows that the positive significant associations between complications of diabetes and dietary pattern. Physical activity like regular exercise and walking, fiber rich diet, regular blood glucose checkup after 35 years are some of preventive measures which can control diabetes.

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1. Introduction

According to IDF diabetes Atlas 9th edition 2019, estimates approximately 463 million adults 20-79 years age group are with diabetes and by 2045, nearly 700 million adults is expected to have diabetes. Number of people deaths due to diabetes is 1,150,300 in 2019. In last 10 years India has witnessed a rapidly exploding epidemic of diabetes.

India leads the world with large number of patients with diabetes so it termed as the “diabetes capital of the world”.¹ DM are often defined as quite common metabolic disorder with various etiologies which is characterized by hyperglycemia and abnormalities in fats, carbohydrates and

protein metabolism resulting from impairment of insulin secretion and defects in insulin action or both. “There are mainly three types of diabetes that is types 1 diabetes, type 2 diabetes and gestational diabetes based on etiology and clinical features.”² Diabetes if left untreated for long time can leads to serious complications such as heart disease, stroke, kidney disease, neuropathy, blindness, diabetic foot and early death.³ Diabetes is a very serious and chronic disease which occurs either when the pancreas does not produce enough insulin (a hormone which is secreted by pancreas that regulates blood sugar, or glucose), or when the body cannot effectively use the insulin it produces.⁴ Diabetes is traditionally known as a “silent disease”, exhibiting no symptoms until it progress to severe target

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organ damage.⁵ Life styles related risk factors may lead to the development and progression of type 2 diabetes. Risk factors such as dietary choices, tobacco smoking, alcohol consumption, overweight or obesity and sedentary lifestyle, these are modifiable. Studies have shown that these factors, if effectively controlled, can lead to reduction in risk of developing further complications.⁶ The diet rich in whole grains, fruits, green vegetables, legumes and nuts, avoids alcohol consumption, and lower in refined grains, red/processed meats, and sugar-sweetened beverages should be consumed in little amount it reduce diabetes risk and improve glycemic control and blood lipids in patients with diabetes.⁷ The day to day care as management of dietary factor, blood glucose level maintenance, proper medicine and avoiding food as simple carbohydrates are the essential responsibility that must be followed by people with type 2 diabetes as well as pre-diabetic people.⁸

2. Materials and Methods

2.1. Planning and preparation of questionnaire-

The questionnaire was composed in 3 parts, the first part contains question which are related to general information about the subjects. The second part of the questionnaire is related to the problems of diabetes and third part of questionnaire contains the question which are related to dietary habits and awareness of subjects about their diet.

2.2. Selection of area

The present study was done on diabetic patients in Deoria and Karaundi Varanasi.

2.2.1. Inclusion criteria

1. Patients diagnosed with Type 2 diabetes.
2. Subjects diagnosed with type 2 diabetes for more than 6 months.
3. Patients age 30-60 years.

2.2.2. Exclusion criteria

1. Type 1 diabetes.
2. Patients with gestational diabetes (pregnant women).
3. Patients age less than 30 years and more than 60 years

2.3. Method of data collection

The pretested questionnaire has been used to collect data by interview schedule method to understand the problems of diabetic patients more clearly and to make aware about their nutritive requirements & preventive measure for diabetic complication.

2.4. Sampling

The sample size was determined as 100 diabetic patients male and female with age group 30-60 years were selected by random sampling method.

2.5. Collection of data

The data was collected from February to March for the period of about 60 days in 2019.

2.6. Tabulation and Analysis of data

The responses of subjects converted in the form of tables to make calculation easier. Simple addition and percentage were used in the analysis of data.

3. Assessment of nutritional status

3.1. Dietary assessment

1. 24 hour dietary recall method was used.
2. Food frequency questionnaire were used.

3.2. Anthropometric measurement-

1. Height and weight were taken.
2. BMI:-BMI were calculated by using the formula kg/m^2 where kg is person's weight in kilograms and m² is their height in meters squared. WHO Classification was used to assess the BMI. People who have <18 BMI are underweight, 18-24.9 normal weight and 25.0-29.9 overweight and ≥ 30 are obese.

4. Results

In the present study maximum 54% respondents were female and 46% respondents were male, 43% study subjects were in the age group of 40-50 years followed by those in 30-40 years that is 34% and 23% study subjects belong to the age group of 50-60 years. Most of the patients were housewife that is 35% and 31% study subjects were non government employee while 86% subjects were married and 8% study subjects were widows. Majority i.e. 53% belongs to joint family and 27% from nuclear family (Table 1)

In Table 2 Most common complication is like retinopathy blur vision and cataract (48%). 54% respondents have diabetes since less than 5 year and only 11% of patients had diabetes since more than 10 years. 42% respondents exercised for 30 minute, 15% respondents for 45 min, 19% respondents for 60 minute & 24% of respondents do not exercise. Only 24% respondents are taking insulin injection and 76% respondents are not taking insulin injection. 65% respondents regularly check their blood glucose level and 35% are not checking their glucose level regularly. 69% of respondents eating food prescribe by doctors & 31% respondents are not eating food prescribed by doctor. Most

Table 1: Distribution of respondent according to the socio demographic profile of the subject

Group	Variable	Frequency	Percentage
Sex	Male	46	46
	Female	54	54
Age-group	30-40	34	34
	40-50	43	43
	50-60	23	23
Occupation	Government employee	27	27
	Non Government employee	32	32
	Daily laborer	3	3
	Housewife	34	34
	House servants	4	4
	Retired	2	2
Hereditary diabetes	Others	3	3
	Yes	41	41
Marital status	No	59	59
	Married	86	86
	Unmarried	6	6
Types of family	Widow	8	8
	Joint	53	53
	Nuclear	27	27
	Extended	20	20

Table 2: Distribution of respondents according to information regarding disease.

Group	Variable	Frequency	Percentage
Complications	Ophthalmic	48	48
	Renal	7	7
	Diabetic foot	4	4
	Heart	22	22
	Others	19	19
Duration of diabetes	<5 year	54	54
	5-10year	35	35
	>10 year	11	11
Duration of Physical activity	30 minutes	42	42
	45 minutes	15	15
	60 minutes	19	19
	No physical activity	24	24
taking Insulin injection	Yes	24	24
	No	76	76
Routine checkup	Yes	65	65
	No	35	35
Diet intake prescribed by doctor	Yes	69	69
	No	31	31
Interval between food intake in hours	1-2	0	0
	2-3	10	10
	3-4	17	17
	4-5	47	47
	>5	26	26

Table 3: Distribution of respondents according to dietary pattern.

Variables	Day/week	Frequency	Percentage
Frequency of eating green leafy vegetable	Daily	46	46
	3-4	39	39
	Twice	11	11
	Once	4	4
Frequency of eating sprouted cereals	Daily	20	20
	2-3	22	22
	Once	15	15
Types of milk consume	No intake	43	43
	Full cream milk	26	26
	Skimmed milk	53	53
	Powdered milk	0	0
Fruits intake	No intake	21	21
	Daily	13	13
	2-3	23	23
Papaya	Once	44	44
	No intake	20	20
	Daily	6	6
Blueberries	2-3	19	19
	Once	40	40
	No intake	35	35
Guava	Daily	10	10
	2-3	41	41
	Once	32	32
Apple	No intake	17	17
	Daily	34	34
	2-3	28	28
Aamla	Once	30	30
	No intake	8	8
	Daily	8	8
Fiber rich diet	2-3	15	15
	Once	52	52
	No intake	25	25
Whole wheat flour	Once	0	0
	Daily	45	45
	Twice	0	0
Mixed flour	No intake	55	55
	Daily	0	0
	Once	10	10
	Twice	15	15
Roasted chana	No intake	75	75
	Daily	10	10
	Once	31	31
	Twice	33	33
Fenugreek seeds	No intake	26	26
	Daily	47	47
	Once	10	10
	Twice	16	16
Whole pulses	No intake	27	27
	Daily	19	19
	Once	39	39
	Twice	25	25
	No intake	17	17

of the respondents i.e. 47% eat between 4-5 hours & 26% respondents eat food more than interval of 5 hours.

The above table shows that 46% respondents were eat green leafy vegetable daily, 11% respondents eat twice in week, 39% respondents eat 3-4 times in week & 4% respondents eat once in a week. 20% respondents eat sprouted cereals daily, 22% respondents eat 2-3 times in week & 15% respondents eat once in a week majority i.e. 43% of respondents were not eat sprouted cereals. 26% respondents drink full cream milk, 53% respondents drink skimmed milk & 21% of respondents were not drink milk. 13% respondents eat papaya daily 23% of respondents eat 2-3 times in week, 42% respondents eat once in a week. 20% of respondents do not eat papaya. Maximum respondents 40% eat blue berries once in a week & 35% do not eat blue berries. 10% respondents eat guava daily, 41% respondents eat 2-3 times in week & 17% of respondents do not eat. 34% of respondents eat apple daily 28% 2-3 times, 30% eat once week & 8% respondents do not eat. Maximum respondents 52% eat amla once in a week & 25% do not eat amla.

Most of the patients do not eat whole wheat flour and 45% patients eat daily. Majority of the participants 75% do not eat mixed flour and only 15% patients eat mixed flour twice in week. Only 33% respondents eat roasted chana twice in a week and 26% respondents do not eat roasted chana. Majority of the respondents i.e. 47% eat Fenugreek seeds daily and 27% respondents do not eat Fenugreek seeds. Maximum patients i.e. 39% eat whole pulses once in a week and 17% patients do not eat whole pulses in week. (Table 3)

5. Discussion

In this study total 100 diabetic patients were included. The present study was conducted at Deoria and Karaundi Varanasi UP. The data was collected from February to March 2019. In this study (Table 1) majority of patients were females this is fact that survey was conducted during day time. Majority i.e. 43% of patients are in group between 40-50 years. Type 2 diabetes usually comes during this age group.

Family history of diabetes is a important risk factor for the development of type 2 diabetes. In our study (Table 2) 41 out of 100 patients have positive hereditary diabetes. In the study conducted by R Singh et al.⁹ in their study out of the total 700 respondents, family risk was observed only in 10.4%. Other study carried by Dr. Kedar et al.¹⁰ in urban slums of Mumbai in 27.40 % were having positive family history. In this study most common complications were ophthalmic 48% like retinopathy, cataract and blurry vision and 22% have heart related complications and 22% have other complications like tingling in hand and feet, numbness and skin problem. High fiber food have a low calorie value and low glycemic index and therefore diabetic should consume such food liberally. Insoluble fibers helps in bowel movements, on the other hand soluble fiber helps to

lower cholesterol. Long term effect of fiber can be seen in the study conducted by S.M Deshmuk et al⁶ in their study 20g of fiber per day (pectin and guar gum) resulted in a 9% reduction in LDL-C level after one year of supplementation. However there are no any changes shown in HDL-C level.

In this study majority of respondents 42% did physical activity for 30 minutes while 24% of the respondents were not involved in physical activity, as a review study, "A cost-effectiveness models of interventions in diabetes by Tucker and palmer¹¹ shows that prolonged session of physical activity enhance the flow of blood in the muscle as well as level of glucose transport into the muscle cell. B Valliyot et al¹² showed that physical activity is a protective factor for the development of DM.

6. Conclusion

It can be concluded that more than half of the respondents were female and diabetes occurred mostly at the age between 40-50 years. Diabetes is a lifetime disease, so proper care should be given on diet. The main purpose of treating T2DM is to help the patients from developing complications which can be attained through proper dietary management. It can be concluded that dietary interventions and lifestyles modifications helps in controlling blood glucose level.

7. Conflicts of Interest

All contributing authors declare no conflicts of interest.

8. Source of Funding

None.

References

- Gupta A, Agarwal N, Byadgi P. Clinical assessment of dietary interventions and lifestyle modifications in Madhumeha (type- 2 Diabetes Mellitus). *AYU (An Int Q J Res Ayurveda)*. 2014;35(4):391. doi:10.4103/0974-8520.158997.
- Sami W, Ansari T, Butt NS, Hamid MRA. Effect of diet on type 2 diabetes mellitus: A review. *Int J Health Sci*. 2017;11(2):65.
- Sanjeevaiah A, Sushmitha A, Srikanth T. Prevalence of Diabetes Mellitus and its risk factors. *IAIM*. 2019;6(3):319–24.
- Barik A, Mazumdar S, Chowdhury A, Rai RK. Physiological and behavioral risk factors of type 2 diabetes mellitus in rural India. *BMJ Open Diabetes Res Care*. 2016;4(1):e000255. doi:10.1136/bmjdr-2016-000255.
- Singh PS, Sharma H, Zafar KS, Singh PK, Yadav SK, Gautam RK, et al. Prevalence of type 2 diabetes mellitus in rural population of India- a study from Western Uttar Pradesh. *Int J Res Med Sci*. 2017;5(4):1363–7. doi:10.18203/2320-6012.ijrms20171227.
- Deshmukh S, Mani U, Desai S. Lifestyle modifications on control of diabetes mellitus. *Int J Diab Dev Ctries*. 2000;20.
- Ley SH, Hamdy O, Mohan V, Hu FB. Prevention and management of type 2 diabetes: dietary components and nutritional strategies. *Lancet*. 2014;383:1999–2007. doi:10.1016/s0140-6736(14)60613-9.
- Parveen H. A review on Diabetes Mellitus with their types, complications, treatment, and research approach. *IJARIT*. 2020; Available from: <https://www.ijarit.com/manuscript/a-review->

[on-diabetes-mellitus-with-their-types-complications-treatment-and-research-approach/](#).

9. Singh R, Kumar A, Kansal S. Association of Pre-Diabetes, Diabetes and BMI with family history: A Cross Sectional study in an urban area of Varanasi. *Indian J Prev Soc Med.* 2019;50(1):7.
10. Raikar KJ, Velhal G, Shukla A. Profile of Type 2 Diabetic Patients in Urban Slums of Mumbai. *Global J Med Res.* 2018;.
11. Tucker DM, Palmer AJ. The cost-effectiveness of interventions in diabetes: A review of published economic evaluations in the UK setting, with an eye on the future. *Primary Care Diabetes.* 2011;5(1):9–17. doi:10.1016/j.pcd.2010.10.001.
12. Valliyot B, Sreedharan J, Muttappallymyalil J, Valliyot SB. Risk factors of type 2 diabetes mellitus in the rural population of North Kerala, India: a case control study. *Diabetologia Croatica.* 2013;42(1).

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