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# Socio Demographic Correlates of Patients with Diabetes Mellitus at a Tertiary Care Center in Ahmedabad, Gujrat, India

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**Abstract- Background: India is experiencing a fast demographic and epidemiological conversion with Non-Communicable disease (NCDs), bookkeeping for two out of each three deaths (1). The most important cause causative to high incidence of diabetes mellitus is quick developmental urbanization, inactive lifestyle, and modify in dietary habits. Aim: To evaluate the relationship between socio demographic individualism and Diabetes Mellitus. Subject and Methods: All subjects were interviewed after obtaining consent from them. The study had approved by the Ethics Committee of IEC-BHR Dr.Jivraj Mehta Smarak Health Foundation, Ahmedabad, and Gujarat, India. A questionnaire have been used which includes the socio demographic, life style, family history of diabetes and the relationship with diabetic patients. A cross sectional study was conducted among 151 patients suffering with type 2 diabetes mellitus and 151 patients with non diabetes mellitus OPD of tertiary care hospital. Socio demographic correlates were assessed by brief questionnaire. Results: Our study reported 59.01% individuals had high fasting blood sugar, high post parandial blood sugar and high Hba1c. The highest prevalence was found in the age group 51-60 years (64.11%). A large figure of the study people (35%) was inactive. A significant proportion of the study subjects had associated co morbidities such as hypertension (21.19%), and hyperlipidemia (7.28%). Fasting blood glucose, postprandial blood glucose, and glycated hemoglobin levels were elevated in both gender.. The values were higher in males, but statistically, the difference was significant. Conclusions: The present study revealed that poor glycemic control, dyslipidemia, sedentary lifestyles, and hypertension were prevalent in T2DM patients. Hence, the overall risk profile in patients from Ahmedabad was very poor and needs improvement. These data can support health professionals' actions to efficiently keep up and afford a more broad advance to organization**

**Keywords- Demographic summary of the chronic diseases plays a major role in the application of prevention and control measures. Information regarding the demographic correlates of diabetes mellitus helps to develop the targeted involvement policies.**

# I. INTRODUCTION

The growing occurrence of diabetes mellitus (DM) has been known as a international risk to community health. This rise in prevalence may be driven by a sedentary lifestyle, obesity and increased consumption of red and processed meat, refined grains and sugar-sweetened beverages (Zheng et al., 2018)(19)

also, there has been a few data that white rice and refined grains that contribute to a huge and unstable amount of every day force eating in Asian diet are linked to diabetes (van Dam, 2020).(25)

Diabetes Mellitus is a condition that causes persistently increased blood glucose levels in the body. It is the second leading cause of years spent disabled globally and is a major cause of death with high mortality rates (23).

Diabetes mellitus is a serious health problem, and its global burden is continually increasing. The International Diabetes Federation estimated that the number of people with diabetes was 451 million in 2017, and that the figure is expected to increase to 693 million worldwide by 2045. (22)

An estimated 9.3% of the total global populations (734 million people) currently have diabetes [6].

Roughly 463 million people have DM worldwide with most cases and the largest increases in prevalence being in low-income and middle-income countries (LMICs).(21)

Diabetes mellitus, largely type 2 diabetes, affects an estimated 537 million adults globally and is a rapidly growing cause of morbidity and premature mortality.

Type 2 Diabetes Mellitus (T2DM) is one of the most common metabolic disorders worldwide and its development is primarily caused by a combination of two main factors: defective insulin discharge by pancreatic β-cells and the incapacity of insulin-sensitive tissues to react to insulin The well-established risk factors for this disease are genetic factors, eating behaviors and exercise (Zheng et al. ).(19)

A key component of type 2 diabetes (T2D) pathogenesis is defective insulin secretion [4]

Diabetes is a rapidly growing health challenge and potential epidemic across the low-and- middle-income countries like India (5)

Diabetes has more and more become general because of quick financial increase and urbanization universal (6). According to the worldwide load of Disease Study, the worldwide age-standardized occurrence of diabetes in 2019 was 5555.39 per 100,000 public, with an age- uniform death rate of 19.47 per 100,000 populations (7).

It cause a bunch of strain on the patients as fine as the caregivers as of its limiting diet, lifestyle/physical movement complication arising due to T2DM, and economic weight because of treatment. (Neilson et al., Citation2021).(8).

DM patients have two times the threat of death as compare to Non-DM patients, this is due to complication cause by DM: Microvascular Complications (retinopathy, nephropathy, and neuropathy) and Macrovascular Complications (cardiovascular disease, cerebrovascular disease, and stroke) (Mokhtari et al., Citation2019)(9)

Worldwide 28% of T2DM patients have different severity of depression and 14.5% of T2DM patients have major depressive disorder (Khaledi et al., Citation2019;(10) Wang et al., Citation2019(11).

Due to simplicity of implementation and cost, community surveys for diabetes often use random capillary blood glucose (RCBG). There is no consensus statement for RCBG cut-off's in Indian people, as said by American Diabetes Association (ADA) guidelines, RCBG ≥ 200mg/dL is considered diagnostic if accompanied by symptoms of hyperglycemia.(24)

Care for chronic diseases like diabetes poses challenges characterized by the need for sustained

compliance to treatment, prevention or management of associated complications (12). This requires the continuous engagement of health systems in the continuum of care at all stages (12). Diabetes care need management crosswise every tier of health care system. Most importantly co-driven by the patient's knowledge, attitudes and perceptions toward awareness, treatment and adherence to the recommendations (12, 13).

Considerate the sociodemographic characteristic of public with diabetes is important for many actions including health-care planning, health education, and public health research. Before developing diabetes-relatedhealth-care products or programs, health-care planners must know the social and demographic characteristics of the target population, they hope to reach. When health educators are preparing diabetes related educational materials or activities, or clinicians and researchers are scheduling treatment protocols, they need to know the demographic profile of the target audience so that appropriate programs or efforts are made available. (14)

**Aim:** To evaluate the relationship between socio demographic individualism and Diabetes Mellitus.

## II. SUBJECT & METHODS

**Study Type, Location and Sample Size**

Current study was a cross-sectional community-based study. The study was conducted in tertiary care hospital of Ahmadabad, Gujarat. Sample size was calculated as 252.

**Inclusion Criteria**

Inclusion criteria for current study were; all patients with type 2 diabetes mellitus and non type 2 diabetes mellitus aged 18 years and above and all those who gave consent for participation in the study.

**Exclusion Criteria**

Exclusion criteria for current study was; presence of any serious physical and mental illness hampering the interview process.

**Procedure**

Question schedule was used for the data collection. Diabetic and nondiabetic Participants were selected from OPD and health checks up department. Informed written consent was obtained from the patients before including them in study. The purpose of this study was explained to the participants in their vernacular language. Individuals selected for the study were interviewed to collect information on sociodemographic. The present descriptive study was conducted from July 2022 to January 2025. Ethical clearance from the Institutional Ethical Committee-BHR and informed consent from patients and controls was taken. A total of 151 T2DM patients (86 males and 65 females) were included in the study. Patients were evaluated with detailed history, Meticulous examination and laboratory investigations. Interrogate survey which built-in question that covered the subject's sociodemographic and lifestyle information were developed for use in the study.

Physical activity was categorized as sedentary (light housework, sitting, standing, and driving for most of the day), moderate (an occupation or housework which involved activities that kept the subject moving for several hours a day), and heavy (heavy manual labor, a very active lifestyle, or very active sports played for several hours almost daily, any activity that involved vigorous activity lasting for several hours, almost daily).(14)Data were at first arranged in Microsoft Excel 2010Worksheet.

## III. RESULTS AND OBSERVATIONS

In the present study carried out in diagnosed cases ofT2DM, the youngest case study was found to be 28 years of age, and the oldest to be 87 years.99.34% patients were on oral hypoglycemic agents and 0.6%on insulin therapy. The duration of diabetes was between 1-5 years in 48.34% and 6-10 years in 19.86%, more than 10 years were 24.50%.

**Socio Demographic Characteristics**

The socio demographic individuality of the study people are shown in Table 1. It was observed that56.95% of the cases are male and 43.04%

female with a male, female ratio of 1.32:1. The highest prevalence was found in the age group 51–60 years (64.11%) followed by the age group of 61–70 (60.58%) as similar found age category 50- 59 years (41.0%) followed by those aged 60 years or more (30.2%) in study Hafiz Ahmed E Mohamed (17). 99.34% of the subjects was literate, with around a quarter (39.07%) completing at least a secondary level of education. About 56.28% of the subjects were unemployed, and a majority of this (35.09%) was women engaged as housewives as 32.5% similar found in study Hafiz Ahmed E Mohamed (17s. Most of the study population (98.01%) wherefrom an urban area. 30(34.88%) participants belonging to the age group 51-60 years of age,,(43.046%) femals.61.58%(93) belongs to middle middle socioeconomic class.

Table: 1: Socio demographic characteristics of subjects with type 2 diabetes mellitus.

| Variable | | | | |
|---|---|---|---|---|
| 1.Age In Years | MALE | % | FEMALE | % |
| 18-40 | 03 | 3.4 | 02 | 3.07 |
| 41-50 | 15 | 17.44 | 09 | 13.84 |
| 51-60 | 30 | 34.88 | 19 | 29.23 |
| 61-70 | 23 | 26.74 | 22 | 33.84 |
| 71-80 | 11 | 12.79 | 10 | 15.38 |
| >80 | 04 | 4.65 | 03 | 4.61 |
| 2.Gender | | | | |
| Male | 86 | 56.95% | | |
| Female | 65 | 43.046% | | |
| 3.Educational status | | | % | |
| Illiterate | 01 | | 0.66 | |
| Primary | 06 | | 3.97 | |
| Secondary | 59 | | 39.07 | |
| Graduate | 68 | | 45 | |
| Postgraduate | 17 | | 11.25 | |
| 4.Occupation | | | % | |
| Service | 55 | | 36.42 | |
| Business | 10 | | 6.6 | |
| Housewife | 53 | | 35.09 | |
| Retie red | 32 | | 21.19 | |
| Farmer | 01 | | 0.66 | |
| 5.Socioeconomi cstatus | | | | |
| <12,500 | 01 | | 0.66% | |
| 12,501-25000 | 28 | | 18.54 | |
| 25001-50000 | 74 | | 49 | |
| 50001-150000 | 48 | | 31.78 | |
| 150001-3,00,000 | 00 | | | |
| Upper middle class | INR50,000 to 2,00,000per month | | 48(31.78%) | |
| Middle middle class | 20,000 to 50000 | | 93(61.58%) | |
| Lower middle class | 10,000 to 20,000 | | 09(5.29%) | |
| Lower class | 6,000 to 10,000 | | 01(0.66%) | |

**Risk Factors**

In the diabetic patients included in the current study, it was found that 36.42% was sedentary. With T2DM a positive family history was found only in 50.33% of the patients. A large fraction of the population indulged in tobacco consumption (12.58%). 0.66% of the diabetic population under study also consume alcoholic beverages. (Table: 2) Half of total diabetic patients (50.33%) had family history of diabetes. 12.58% patients had addiction of tobacco. 21.19% patients had hypertension like concurrent illness. Majority of 48.34% patients had 1 to 5 years of duration of diabetes.

Table: 2: Distribution of no modifiable risk factors in participants with type 2 diabetes mellitus.

| Habit | | % |
|---|---|---|
| Tobacco | 19 | 12.58 |
| Alcohol | 01 | 0.66 |
| Family History(DM) | | % |
| Yes | 76 | 50.33 |
| No | 75 | 49.66 |
| Physical activity | | |
| Sedentary | 87 | 57.61 |
| Moderate | 63 | 41.69 |
| Heavy | 1 | 0.66 |

**Clinical Characteristics**

FBG levels, post prandial blood glucose levels and glycated hemoglobin tended to be higher in males as compared to females, statistically, the difference was significant. Glycemic control was poor in majority of the patients with T2DM, with 38.55% having glycatedhemoglobin more than 7.5%. Blood investigation showed that high level of FBS,PPBS,HBA1C in diabetic group.86.66% patients had normal serum cholesterol and 50% of patients had high serum HDL(Table:3).

Table: 3: Clinical characteristics of participants with type 2 diabetes mellitus.

| Blood Sugar | FBS | PPBS | HBA1C | % | | |
|---|---|---|---|---|---|---|
| Normal | 22 | 17 | 03 | 18.32 | 17.34 | 3.6 |
| | 72 | 43 | 66 | 59.01 | 43.87 | 79.51 |
| High | | | | | | |
| Average | 28 | 38 | 14 | 22.95 | 38.77 | 38.77 |
| Total | 122 | 98 | 83 | | | |
| High | 72 | 43 | 66 | 59.01 | 43.87 | 79.51 |
| Male | 42 | 26 | 43 | 58.33 | 60.46 | 65.15 |
| Female | 30 | 17 | 23 | 41.66 | 39.53 | 34.84 |

| Lipid Profile | Scholesterol | S.HDL | S.LDL | S.TRI | S.VLDL |
|---|---|---|---|---|---|
| Normal | 52 | 07 | 24 | 36 | 25 |
| | 86.66% | 18.42% | 60% | 90% | 86.20% |
| High | 02 | 19 | 04 | 04 | 04 |
| | 3.2 | 50% | 10 | 10 | 13.79 |
| Average | 06 | 14 | 12 | | |
| | 10 | 36.84% | 30 | | |
| Total | 60 | 38 | 40 | 40 | 29 |

## IV. DISCUSSION

Age, obesity, family history of diabetes, a sedentary lifestyle, and the incidence of other modern lifestyle disorders such as hypertension and dyslipidemia were linked to an increased risk of developing diabetes (Sameer et al., 2020).20

Glycemic control (FBS), HbA1c, total cholesterol, HDL and triglyceride are critical indicators of diabetes. Health status, glycemic control and metabolic control factors in diabetes correlated significantly with self-perceptions of health.18.

Our study included 151 diabetic patients who attended medicine OPD of. Tertiary care hospital of which86 (56.95%) were male and 65 (43.04%) were females. We had 03 (1.98%) of rural patients and 148 (98.01%) of patients from urban side... Regarding glycaemic control 3.6% of patients had their normal HBA1C. There was no statistical significant difference in blood sugar levels between urban and rural population.

5.9% involvements in siblings were noticed in the present study.

In our study mentioned sample (n=151) of diabetes patients as compared 151 presents the socio-demographic characteristics of the sample (n = 148) in Zhenzhen Xie,(16).

In the present study carried out in diagnosed cases ofT2DM, the highest prevalence was found in the age group 51–60years (64.11%) followed by the age group of61–70 (60.58%). Similar findings were also observed in study of Praizy Bhandari*, N. K. Goel, Dinesh Walia, Meenu Kalia)15. Age is one of the important risk factors for many non communicable diseases including diabetes mellitus. In the present study, it was also seen that there was as light male preponderance in cases of diabetes mellitus with a male: female ratio of 1.32:1. In our study when 134 patients had different observed a male to female ratio of 0.97:1 in study of Praizy Bhandari*, N. K. Goel, Dinesh Walia, Meenu Kalia)15. 56.28% participants were unemployed which included retired, housewife and As age increases, unemployment increases because the number of retired add up. Most participants belonged to the Middle middle class followed by upper middle middle class.(15)

In the present study, it was observed that 0.66% of the study subjects were illiterate and (39.07%) were educated secondary school level similar findings 28%were also observed in (Socio demographic correlates of quality of life of patients with diabetes mellitus

Praizy Bhandari*, N. K. Goel, Dinesh Walia, Meenu Kalia (15)

Majority of patients were used anti diabetic drug like Biguanide(58.27%) and sulfonylureas (50.99%) when alpha glucosidase inhibitors (9.27%) and SGLT2 inhibitors (3.31%) were less used.

It was also observed that a significant proportion of the study subjects had associated co morbidities such as hypertension (21.19%), and dyslipidemia (7.89%) when as study of Hossein Amini(18) found

that 57.5% of diabetic patients also had co morbidity.

Large number of the participants (35%) led a sedentary lifestyle. it was also observed that the FBG,postprandial blood glucose, and glycated hemoglobinlevels were elevated in both males and females. The values of all three parameters were higher in males as compared to females statistically, the difference was significant. In our study, only 3.6% of the patients had managed to achieve good glycemic control (<6.5%). 21.1% of the participants had "good" control levels of HbA1C in studyHossein Amini(18)1 The results of the present study, revealed a prevalence of uncontrolled glycaemia of 79.5% as compared 63.7%found in study Hafiz Ahmed E Mohamed (17) and 65.7% in study Hossein Amini (18).

Several limitations in this study should be considered before generalizability including small sample size, which may not have been large enough to detect potential relationships.

## V. CONCLUSION

The present study revealed that poor glycemic control, dyslipidemia, sedentary lifestyles, and hypertension were prevalent in T2DM patients. Hence, the overall risk profile in patients from Ahmedabad was very poor and needs improvement. These data can support health professionals' actions to effectively maintain and provide a more comprehensive approach to management.

**Key Messages:** Demographic summary of the chronic diseases plays a major role in the application of prevention and control measures. Information regarding the demographic correlates of diabetes mellitus helps to develop the targeted intervention policies.

Ethical approval: All procedures performed in the studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards

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Conflicts of interest
There are no conflicts of interest.

## REFERENCES

1. World Health Organization, "National Multisectoral Action Plan for Prevention and Control of Common Non communicable Diseases." p. 74, 2018.
2. Magliano, D.J. · Boyko, E.J. IDF diabetes atlas 10th edition scientific committee. IDF diabetes atlas International Diabetes Federation, Brussels, 2021 [cited 2023 Aug 31]. (IDF Diabetes Atlas). Available from:http://www.ncbi.nlm.nih.gov/books/NBK5819 4/
3. Roden M., Shulman G.I. The integrative biology of type 2 diabetes. Nature. 2019;576:51–60. doi: 10.1038/s41586-019-1797-8. [DOI] [PubMed] [Google Scholar.
4. U. GaliciaGarcia, A. BenitoVicente, S. Jebari, A. LarreaSebal, H. Siddiqi, K.B. Uribe, H. Ostol aza, C.J.Ijoms MartínPathophysiology of type 2 diabetes mellitus. 21 (17) (2020), p. 6275, 10.3390/ijms21176275
5. Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: results from the international diabetes federation diabetes atlas, 9(th) edition. Diabetes Res Clin Pract. (2019) 157:107843. doi: 10.1016/j.diabres.2019.107843. PMID: [DOI] [PubMed]]
6. GBD 2019 Diseases and Injuries Collaborators . Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the global burden of disease study 2019. Lancet. (2020) 396:1204–22. doi: 10.1016/s0140-6736(20)30925-9, PMID: [DOI] [PMC free article] [PubMed
7. Neilson, L. M., Munshi, K. D., Peasah, S. K., Huang, Y., Swart, E. C. S., Henderson, R.,

Manolis, C., & Good, C. B. (2021). Changes in type 2 diabetes medication utilization and costs in the United States, 2014–2019. Medical Care, 59(9), 789–794. https://doi.org/10.1097/MLR.0000000000001597

8. Mokhtari, Z., Gheshlagh, R. G., & Kurdi, A. (2019). Health-related quality of life in Iranian patients with type 2 diabetes: An updated meta-analysis. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 13(1), 402–407. https://doi.org/10.1016/j.dsx.2018.10.007
9. Khaledi, M., Haghighatdoost, F., Feizi, A., & Aminorroaya, A. (2019). The prevalence of comorbid depression in patients with type 2 diabetes: An updated systematic review and meta- analysis on huge number of observational studies. Acta Diabetologica, 56(6), 631–650. https://doi.org/10.1007/s00592-019-01295-9
10. Wang, F., Wang, S., Zong, Q-Q, Zhang, Q., Ng, C. H., Ungvari, G. S., & Xiang, Y-T. (2019). Prevalence of comorbid major depressive disorder in type 2 diabetes: A meta-analysis of comparative and epidemiological studies. Diabetic Medicine, 36(8), 961–969. https://doi.org/10.1111/dme.14042
11. Tripathy JP, Sagili KD, Kathirvel S, Trivedi A, Nagaraja SB, Bera OP, et al. Diabetes care in public health facilities in India: a situational analysis using a mixed methods approach. Diabetes Metab Syndr Obes. (2019) 12:1189–99. doi: 10.2147/DMSO.S192336
12. Lall D, Engel N, Srinivasan PN, Devadasan N, Horstman K, Criel B. Improving primary care for diabetes and hypertension: findings from implementation research in rural South India. BMJ Open. (2020) 10:e040271. doi: 10.1136/bmjopen-2020-040271
13. Sociodemographic and clinical characteristics ofa diabetic population at a tertiary care center inAssam, India.Meghna Borah, Rohini Kanta Goswami
14. (Socio demographic correlates of quality of life of patients with diabetes mellitus Praizy Bhandari*, N. K. Goel, Dinesh Walia, Meenu Kalia)
15. An examination of the socio-demographic correlates of patient adherence to self-management behaviors and the mediating roles of health attitudes and self-efficacy among patients with coexisting type 2 diabetes and hypertension.Zhenzhen Xie, Kaifeng Liu, Calvin Or, Jiayin Chen, Mian Yan & Hailiang Wang BMC Public Health volume 20, Article number: 1227 (2020)
16. Association of Sociodemographic Characteristics and Lifestyle with Type 2 Diabetes Mellitus and Glycemic Control: A Cross-Sectional Study
17. Hafiz Ahmed E Mohamed1*, Mohamed Mohei ElDin Makhlouf2, Abduljaleel Abdullatif Zainel3, Sherif Omar Osman2, Nagah Selim4
18. Correlation between socio-demographic characteristics, metabolic control factors and personality traits with self-perceived health status in patients with diabetes: A cross-sectional study
19. Hossein Amini 1, Mohammad Meskarpour-Amiri 2, Mahboobeh Sadat Hosseini 1, Mohammad Farjami 3, Sara Ashtari 4, Amir Vahedian-Azimi 5,✉, Thozhukat Sathyapalan 6, Amirhossein Sahebkar 7,8,✉
20. Zheng Y, Ley SH, Hu FB: Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. Nat Rev Endocrinol. Nature Publishing Group. 2018; 14(2): 88–98. PubMed Abstract | Publisher Full Text
21. The impact of sociodemographic determinants and diabetes type-2 on oral health outcomes: An analytical cross-sectional study.Ashwaq Alkahtani, Paul Anderson, Aylin Baysan
22. First published: 31 January 2024, https://doi.org/10.1002/cre2.846
23. International Diabetes Federation In: Diabetes Atlas Ninth edition 2019.International Diabetes Federation. Brussels, 2020. Available: https://www.idf.org/aboutdiabetes/what-is-diabetes/facts- figures.html
24. Cho NH, Shaw JE, Karuranga S, Huang Y, da Rocha Fernandes JD, Ohlrogge AW, et al. IDF Diabetes Atlas: global estimates of diabetes prevalence for 2017 and projections for 2045. Diabetes Res Clin Pract. 2018; 138:271–281. doi: 10.1016/j.diabres.2018.02.023. [DOI] [PubMed]]

25. Alzyoud, M., Alazaidah, R., Aljaidi, M., Samara, G., Qasem, M., Khalid, M., & Al- Shanableh, N. (2024). Diagnosing diabetes mellitus using machine learning techniques. International Journal of Data and Network Science, 8(1), 179-188.
26. Standards of Medical Care in Diabetes-2019. Diabetes care 42, S1 (2019).
27. van Dam, R. M. (2020) A global perspective on white rice consumption and risk of type 2 diabetes. Diabetes Care, 43, 2625–2627.