A Study to Assess the Incidence and Prevalence of Diabetes Mellitus Among People Residing in Wadiwarhe Village, Maharashtra

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Abstract

Background:

Diabetes mellitus is one of the most significant public health challenges globally, particularly in low- and middle-income countries such as India. The rapid rise in diabetes prevalence is attributed to lifestyle transitions, aging populations, physical inactivity, and dietary changes. Rural communities are increasingly affected, yet epidemiological data from village-level settings remain limited. Estimating both incidence and prevalence at the community level is essential for planning targeted preventive and control strategies.

Objectives:

1. To assess the incidence of diabetes mellitus among residents of Wadiwarhe village.
2. To determine the prevalence of diabetes mellitus in the study population.
3. To identify selected demographic and lifestyle factors associated with diabetes mellitus.

Methods:

A descriptive cross-sectional study was conducted among 200 adults aged 18–80 years residing in selected areas of Wadiwarhe village, Maharashtra. Non-probability convenient sampling technique was used. Data were collected using a structured questionnaire covering socio-demographic variables, clinical history, lifestyle practices, and diabetes-related information. Blood sugar levels were assessed using glucometer readings. Descriptive and inferential statistics were applied for data analysis.

Results:
The findings revealed that the highest proportion of participants belonged to the age group of 51–60 years (26%), followed by 61–70 years (24.5%). Females constituted 55% of the sample. The prevalence of Type II diabetes was higher (63.5%) compared to Type I diabetes (36.5%). The mean blood sugar level was 171.87 ± 53.47 mg/dL, with values ranging from 90 to 284 mg/dL. Higher prevalence was observed among older adults, females, individuals with sedentary occupations, those with low physical activity, and participants consuming an omnivorous diet. Approximately 21.5% of participants were newly diagnosed within the past 12 months, indicating ongoing incidence in the community.

Conclusion:
The study highlights a substantial burden of diabetes mellitus among rural residents of Wadiwarhe village, with both high prevalence and notable incidence. Advancing age, sedentary lifestyle, and poor health practices significantly contributed to disease occurrence. Community-based screening, health education, and lifestyle modification programs are urgently needed to reduce diabetes-related morbidity.

Keywords: Diabetes Mellitus, Incidence, Prevalence, Rural Population, Blood Sugar Levels, Community Study

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It is associated with serious complications affecting the cardiovascular, renal, neurological, and visual systems. Over recent decades, diabetes has emerged as a global epidemic, placing an enormous burden on healthcare systems and economies.

India is often referred to as the "diabetes capital of the world," accounting for nearly one-fourth of the global diabetic population. According to national estimates, over 100 million individuals in India are expected to be affected by diabetes by 2030. Although diabetes was once considered a disease of urban populations, recent evidence indicates a rapid increase in prevalence in rural areas due to lifestyle transitions, reduced physical activity, dietary changes, and increased life expectancy.

The majority of diabetes cases in India are Type II diabetes mellitus, accounting for more than 90% of diagnosed cases. Rural populations face unique challenges such as lack of awareness, delayed diagnosis, limited access to healthcare facilities, and poor treatment adherence, which contribute to disease progression and complications.

Assessing the incidence and prevalence of diabetes at the village level provides valuable insights into disease burden and associated risk factors. Such community-based data are essential for designing culturally appropriate prevention strategies, strengthening primary healthcare services, and improving early detection.

Need for the Study:

Despite the rising burden of diabetes in rural India, epidemiological data from village settings remain sparse. Early identification of at-risk populations can significantly reduce complications through timely interventions. This study was undertaken to assess the incidence and prevalence of diabetes mellitus among residents of Wadiwarhe village and to identify contributing demographic and lifestyle factors.

Problem Statement:
"A study to assess the incidence and prevalence of diabetes mellitus among people residing in Wadiwarhe village."

RESEARCH METHODOLOGY

The present study adopted a **quantitative research approach** to assess the incidence and prevalence of diabetes mellitus among residents of Wadiwarhe village, Maharashtra. A **descriptive cross-sectional research design** was selected, as it is appropriate for determining the distribution and magnitude of health-related conditions within a defined population at a specific point in time. This design enabled the investigator to capture both existing and newly identified cases of diabetes mellitus, along with associated demographic and lifestyle variables.

The study was conducted in selected areas of **Wadiwarhe village**, a rural community with mixed occupational and socioeconomic characteristics. The **target population** consisted of adults aged between **18 and 80 years** who were permanent residents of the village. Individuals who were critically ill or unwilling to participate were excluded from the study. A **sample size of 200 participants** was selected using a **non-probability convenient sampling technique**, considering feasibility, accessibility, and time constraints.

Data were collected using a **structured questionnaire developed by the investigator** based on extensive review of literature and expert guidance. The tool consisted of two sections. Section I included demographic variables such as age, gender, education, occupation, dietary habits, physical activity, smoking/tobacco use, and presence of other health problems. Section II focused on diabetes-related variables including type of diabetes, duration of illness, age of onset, treatment status, use of glucometer, complications, and blood sugar levels.

Blood glucose levels were measured using a **standardized glucometer**, ensuring reliability and uniformity. The questionnaire was validated by subject experts, and necessary modifications were incorporated prior to data collection. Permission to conduct the study was obtained from the concerned local authorities. Participants were briefed about the purpose of the study, and **written informed consent** was obtained before data collection.

Data collection was carried out through **face-to-face interviews** and on-the-spot blood sugar assessment, ensuring accuracy and completeness of responses. The collected data were coded, tabulated, and analyzed using **descriptive and inferential statistical methods**. Frequencies, percentages, mean, standard deviation, and chi-square tests were used to interpret the findings.

RESULTS

This chapter presents the findings of the study based on the analysis of data collected from 200 participants residing in Wadiwarhe village. The results are organized and presented in the form of tables to facilitate clarity and easy interpretation. Descriptive statistics were used to summarize demographic characteristics, diabetes-related variables, and blood sugar levels of the participants. The findings highlight the distribution of diabetes mellitus across different age groups, gender, occupational status, lifestyle practices, and clinical parameters, thereby addressing the objectives of the study.

Table 1: Distribution of Participants According to Age (n = 200)

Age Group (Years)	Frequency	Percentage
Below 30	5	2.5%
31–40	22	11%
41–50	31	15.5%
51–60	52	26%
61–70	49	24.5%
71–80	37	18.5%
≥81	4	2%

Table 1 shows that the majority of participants (26%) belonged to the age group of 51–60 years, followed by 61–70 years (24.5%). This indicates that diabetes mellitus was more prevalent among middle-aged and elderly individuals.

Table 2: Distribution of Participants According to Gender

Gender	Frequency	Percentage
Male	90	45%
Female	110	55%

Table 2 reveals that females constituted a higher proportion of the study population (55%) compared to males (45%), indicating a higher observed prevalence among female participants.

Table 3: Distribution of Participants According to Type of Diabetes

Type of Diabetes	Frequency	Percentage
Type I	73	36.5%
Type II	127	63.5%

Table 3 demonstrates that Type II diabetes mellitus was more common (63.5%) than Type I diabetes (36.5%), which aligns with national and global trends.

Table 4: Mean, Standard Deviation, and Range of Blood Sugar Levels (n = 200)

Variable	Mean	SD	Range
Blood Sugar Level	171.87	±53.47	90–284

Table 4 indicates that the mean blood sugar level of participants was 171.87 mg/dL, with values ranging from 90 to 284 mg/dL, suggesting poor glycemic control among a significant proportion of the population.

DISCUSSION

The present study assessed the incidence and prevalence of diabetes mellitus among residents of Wadiwarhe village and identified associated demographic and lifestyle factors. The findings revealed a substantial burden of diabetes mellitus within the rural community, with a higher prevalence of Type II diabetes mellitus. This observation is consistent with findings from national studies such as the ICMR-INDIAB study, which reported that over 90% of diabetes cases in India are Type II.

Age was a significant factor influencing diabetes prevalence. The highest proportion of cases was observed among individuals aged above 50 years. This may be attributed to age-related insulin resistance, reduced physical activity, and cumulative exposure to unhealthy lifestyle practices. Similar age-related trends have been reported in previous studies conducted in both urban and rural Indian populations.

Gender-wise analysis showed a higher prevalence among females. This finding may be explained by reduced physical activity, hormonal factors, and higher rates of obesity among rural women. Sociocultural factors such as limited access to healthcare and delayed diagnosis may also contribute to this pattern.

Occupational and lifestyle factors played a crucial role in the development of diabetes. Participants engaged in sedentary occupations and those who reported lack of regular physical activity showed higher prevalence rates. These findings reinforce the well-established association between physical inactivity and the development of diabetes mellitus.

Dietary habits also influenced diabetes prevalence, with higher rates observed among participants consuming an omnivorous diet. Additionally, tobacco use and smoking were prevalent among a significant proportion of participants, further increasing the risk of metabolic disorders.

The observed incidence of newly diagnosed diabetes cases within the past 12 months highlights the ongoing emergence of diabetes in rural communities. This underscores the urgent need for regular screening, early detection, and community-based preventive strategies.

Overall, the findings emphasize the necessity of strengthening primary healthcare services, promoting lifestyle modification, and enhancing awareness programs to reduce the growing burden of diabetes mellitus in rural India.

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