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Assessment of the Prevalence of Diabetes Mellitus Risk Cases Among Middle Age Group People

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Abstract

The cognizance of diabetes mellitus to humankind is as old as their own history of civilization. Description about diabetes is mentioned in Greek, Egyptian, Arabic, Chinese, and even in Indian medicine. Mellitus is a Latin word. The presence of a sweet taste in urine is employed to differentiate it from other poly uric conditions where glycosuria is not present. Diabetes is currently recognized as a diverse group of diseases characterized by chronic hypoglycemia, stemming from various underlying etiological factors, encompassing both environmental and genetic influences. Presently, over 70% of individuals with diabetes reside in low- and middle-income countries. It is estimated that 285 million people, constituting 6.4% of the global adult population, lived with diabetes in 2010. Among them, 20% of the current diabetic population were situated in the Southeast Asia region. The number of individuals with diabetes in these countries is anticipated to triple by the year 2025.

Keywords: Diabetes mellitus, Indian medicine, hypoglycemia, environmental and genetic influences

INTRODUCTION

Diabetes is an "iceberg" disease. Previously it was a disease of the middle aged and elderly. Recently, type 2 diabetes mellitus has escalated in all age groups and is now being seen in younger age groups, including adolescents, especially in high-risk population. The Indian Council of Medical Research studies reported the prevalence of diabetes among the rural population from 0.4% in Himachal Pradesh, 1.3% in Kerala, 1.5% in Delhi, and 3.9% in Gujarat. National survey shows that 54.1% of patients developed diabetes in the most productive age of their lives, that is, before the age of 50 years and they also had higher risk of developing diabetic complications.

Non-insulin-dependent diabetes mellitus (NIDDM) typically becomes evident during midlife and subsequently increases in prevalence. Childhood obesity is a precursor, putting individuals at elevated risk of developing type 2 diabetes in later years. Sedentary lifestyles are identified as significant risk factors for NIDDM development. Additionally, women who have given birth to a baby weighing more than 4.5 kg, those who exhibit excessive weight gain during pregnancy, and individuals with premature atherosclerosis are also at risk. The research focused on the global prevalence of diabetes mellitus across all age groups worldwide, revealing estimates of 2.8% in 2000 and a projected increase to 4.4% by 2030. The total number of individuals affected by diabetes is expected to surge from 171 million in 2000 to 366 million in 2030. While diabetes prevalence is higher in men than women, the absolute number of women with diabetes surpasses that of men. The most significant demographic shift influencing diabetes prevalence

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globally appears to be the rising proportion of affected individuals. The study's findings suggest that the “diabetes epidemic” is anticipated to persist even if obesity rates remain constant [1–5].

OBJECTIVES

1. To assess the prevalence of diabetes mellitus risk cases in middle age group people.
2. To find out the level of diabetes mellitus risk cases in middle age group people.
3. To find out the association between diabetes mellitus risk cases score with selected demographic variables.

DELIMITATIONS

Study is delimited for:

- The study period is limited to a period of 4 to 6 weeks.
- Sample size is limited to 60.
- The study area is limited to rural areas.

HYPOTHESES

The following hypotheses will be tested at 0.05 level of significance.

- *H1:* A substantial prevalence of risk cases of diabetes mellitus exists among the middle-aged population in rural areas.
- *H2:* There will be a notable correlation between risk cases of diabetes mellitus and selected demographic variables.

REVIEW OF LITERATURE

A cross-sectional survey was conducted among Indian housewives and their family members, with a mean age of 39.6 years (6764 females), using a stratified random sampling technique. Data on behavioral, clinical, and biochemical risk factors for diabetes mellitus (DM) were collected through standardized instruments. DM was diagnosed when fasting blood glucose was ≥7.0 mmol/L or when individuals were undergoing drug treatment for DM. The study results revealed that in the age group of 20 to 69 years, the crude prevalence of DM and impaired fasting glucose was 10.1% and 5.3%, respectively. The study concluded that individuals in the lower education group exhibited a high prevalence of DM (11.6%). Additionally, 38.4% of diabetic subjects were unaware of their diabetes condition. The global prevalence of type 2 diabetes mellitus is increasing at an alarming rate, reaching epidemic levels. In India, the current prevalence of diabetes is approximately 13% to 15%. Cardiovascular disease stands as the primary cause of death among individuals with diabetes mellitus. Efforts to enhance these statistics typically concentrate on preventing coronary artery disease [6, 7].

The study findings regarding the general population provide a summary of the current state of knowledge in the field of diabetes patient education research, emphasizing key unresolved issues. This encompasses 2% to 5% of individuals with early-onset type 2 diabetes and mild disease. The study recorded diabetes mellitus in 11.2% of males and 9.9% of females, resulting in an overall prevalence of 10.3%. Analysis by body mass index (BMI) revealed higher obesity prevalence in females (15.6%) compared to males (13.3%). Above the age of 30 years, both males and females exhibited a significant increase in diabetes prevalence. The notable prevalence of obesity, dyslipidemia, and diabetes mellitus, coupled with a substantial rise in body fat and obesity patterns in middle-aged individuals, especially females, necessitates urgent attention in terms of preventive measures and health education within such underserved populations.

A study was conducted with urban population in northeastern India. In a total of 1016 randomly selected adults ages 20 years (595 men, 421 women) glucose tolerance was tested. The prevalence of Type 2 diabetes, adjusted for age, was 8.2% overall, with 8.7% in men and 7.8% in women. The age-adjusted prevalence of impaired glucose tolerance (IGT) was 4% overall, 4.1% in men, and 3.8% in

women. Multiple regression analysis revealed significant associations between type 2 diabetes and factors such as age, family history, increasing socioeconomic status, and decreasing physical activity. Sex and BMI did not contribute significantly. Similar results were observed in the IGT group, where BMI emerged as a contributory factor. This study indicates a high prevalence of type 2 diabetes in urban areas of Assam, aligning with findings from urban populations in southern India.

A study's findings showed that Indians living in urban areas of the country had a prevalence of diabetes like that of migrant Indians who were living in other countries. There was an observed rise in the prevalence of diabetes over the years, particularly in urban populations. For instance, studies conducted in south India showed that the prevalence of diabetes in adults in urban areas had shot up from 5.0% to 13.9% within 16 years. In each of the cities studied diabetes prevalence is higher than 9.0%, with rates ranging from 9.3% to 16.6%. The average prevalence in urban Indian adults is 12.1%. As modern cities sprawl and rural towns expand, many parts of India that were once rural are now undergoing a phase of urbanization. The outlook for diabetes in these semi-urban zones is bleak. For instance, a study conducted in semi urban areas around Chennai in south India showed a prevalence of diabetes midway between the rural and urban rates.

The research, conducted by MV Hospital for Diabetes and Diabetes Research Centre, a World Health Organization Collaborating Centre for Diabetes in India, revealed that over 35 million Indians are affected by diabetes. Alarmingly, around 13 million cases (50% in rural India and 30% in urban India) go undiagnosed, leading to long-term complications. Factors such as widespread urbanization, reduced physical activity, resulting obesity, stress, and various environmental influences contribute to the high incidence of diabetes in India.

Another study, focusing on the prevalence of DM and IGT among 866 Indians in the Chatsworth area of Durban, was conducted. The study group, selected through cluster sampling, underwent a modified glucose tolerance test (GTT). Results indicated an overall prevalence of 11% for DM and 5.8% for IGT. Among 368 men, 7.6% had DM and 7.1% had IGT, while women had a higher prevalence of DM (13.5%) and a lower prevalence of IGT (4.8%). The study concluded that obesity is commonly associated with both DM and IGT, especially among women [8–10].

METHODOLOGY

Research Approach

Given the nature of the selected study problem and the objectives to be achieved, a descriptive exploratory research approach was deemed suitable and the most appropriate for the current investigation.

Research Design

The aim of research design is to enhance control and thereby enhance the validity of the study in addressing the research problems. Researchers have formulated designs to address specific research needs as they arise. The chosen research design for the current study was the descriptive exploratory design.

Setting

The study was conducted for middle age group people residing in selected rural areas at Guntur district.

Population

Population of this study compromises of middle age group people in selected rural community in Guntur district.

Sample Size

The sample size of the present study was 60.

Sampling Procedure

Purposive sampling technique was used for the study.

Inclusion Criteria for Sampling

- Age between 35 and 60 years only.
- Those who are willing to participate in the study.
- Those who are present during the study.

Exclusion Criteria for Samplings

- Age less than 35 years.
- Age more than 60 years.
- Known case of diabetes mellitus.

DESCRIPTION OF THE TOOL

The instrument used for this study was a checklist of signs and symptoms of DM which was designed by the investigator.

It consists of two sections:

1. *Section A:* An interview schedule was used to collect data about demographic variables such as age, gender, educational status, type of family and economical status.
2. *Section B:* It consists of a checklist of signs and symptoms of DM.

Score Interpretation

Information regarding demographic data was collected from old age people of rural community. Based on their answer the tick mark (✓) was put the appropriate response of each item.

Section B: Diabetes mellitus risk assessment form (Figure 1).

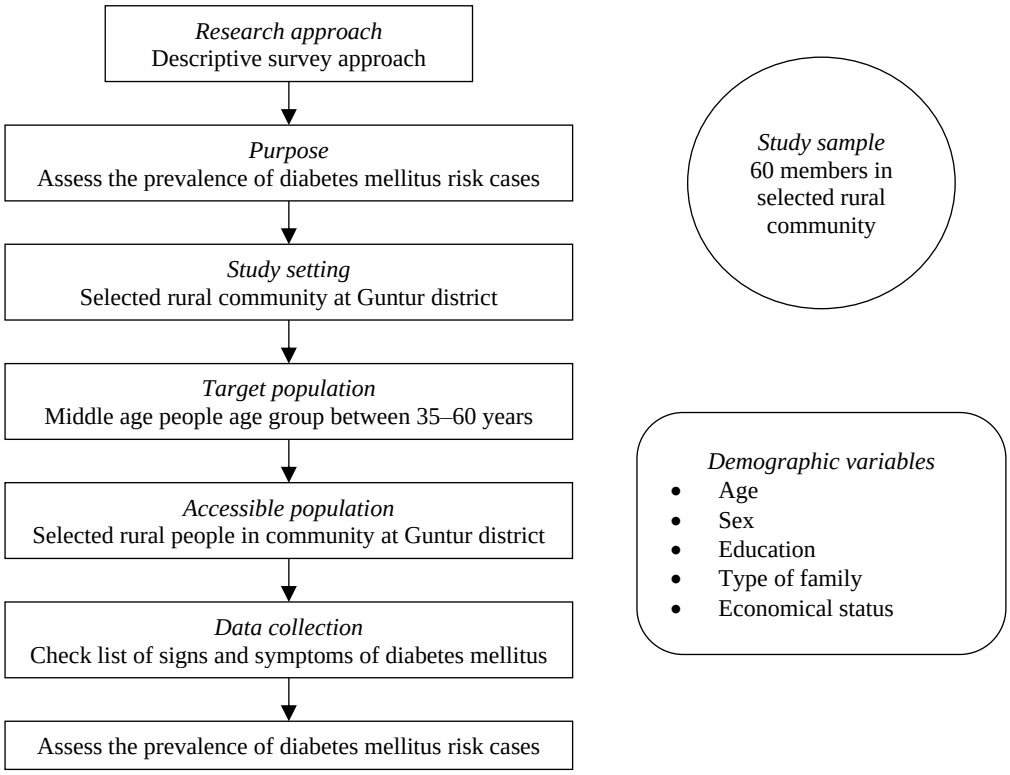

Figure 1. Schematic representation and data analysis.

DISSCUSSION

The FBS mean value is 3.77 with the standard deviation 1.88 and the mean percentage is 37.7%, whereas the PPBS mean value is 8.13 with the standard deviation 1.08 and the mean percentage is 81.3%. The calculated value t = 12.5887 at the level t59 the tabulated value is 2.000. Hence the calculated value is more than tabulated value (Tables 1–3).

Table 1. Distribution of study participants with modifiable risk factors.

Variable	Type-2 diabetes mellitus	Normal	$P < 0.05$
Tobacco use			
Yes	10	20	X = 2.222 P = 0.136
No	5	25	
Alcohol intake			
Yes	10	15	X = 5.142857 P = 0.02334
No	5	30	
Diet			
Mixed	8	20	X = 0.3571 P = 0.55
Vegetarian	7	25	
Physical activity			
Yes	6	25	X = 1.090100 P = 0.296449
No	9	20	
Body mass index			
<25 kg/m^2	5	30	X = 5.142857 P = 0.02334
>25 kg/m^2	10	15	
Waist-hip ratio			
<0.85	3	30	X = 9.8989 P = 0.001
>0.85	12	15	
Blood pressure			
Hypertensive	12	40	X = 0.769230 P = 0.380455
Non-hypertensive	3	5	

Table 2. Distribution of study participants with non-modifiable risk factors for diabetes mellitus.

Variable	Type 2 diabetes mellitus	Normal	$P < 0.05$
Age in years			
35–40	5	15	X = 2.3703 P = 0.667988
41–45	3	12	
46–50	2	8	
51–55	4	5	
56–60	1	5	
Sex			
Male	12	30	X = 0.9523 P = 0.329
Female	3	15	
Family history of diametes mellitus			
Yes	10	40	X = 4 P = 0.04550
No	5	5	

Table 3. Comparison of mean scores between fasting blood sugar (FBS) and postprandial blood sugar (PPBS).

S.N.	Group	Mean	Mean percentage	Standard deviation	't' value
1	FBS	3.77	37.7%	1.88	T = 12.5887
2	PPBS	8.13	81.3%	1.08	*df* = 59 at level of 0.05 t59 = 2.000

CONCLUSION

In conclusion, our assessment of the prevalence of diabetes mellitus risk cases among the middle-age group highlights a concerning trend within this demographic. The findings underscore the urgency of proactive public health measures and targeted interventions to address the escalating risk of diabetes in middle-aged individuals. With a notable percentage of this population displaying risk factors associated with diabetes, such as sedentary lifestyles, unhealthy dietary habits, and genetic predispositions, there is a clear need for comprehensive and accessible healthcare initiatives. The implications of these findings extend beyond individual health, as the burden of diabetes places a significant strain on healthcare systems and contributes to the rising global epidemic of non-communicable diseases. Efforts to raise awareness, promote lifestyle modifications, and enhance early detection mechanisms should be prioritized to mitigate the impending public health crisis. Moreover, collaborative efforts between healthcare professionals, policymakers, and community leaders are imperative to implement effective strategies for diabetes prevention and management. Investing in education, creating supportive environments for healthy living, and fostering a culture of regular health screenings are integral components of a multifaceted approach to curb the escalating prevalence of DM among the middle-age group. In the face of this growing health challenge, a concerted commitment to preventive healthcare measures and the establishment of sustainable interventions will be crucial for mitigating the impact of diabetes on individuals, families, and society at large. The time to act is now, as we strive to empower the middle-age population with the knowledge and tools needed to navigate a path towards healthier, more resilient futures.

Implications

The study's results have various implications for the fields of nursing practice, nursing education, nursing administration, and nursing research.

Nursing Education

- Nursing curriculum should be updated regarding techniques on reduction of stress and related topics should be integrated at different levels to improve adequate knowledge on DM.
- Nursing instructors need to lay emphasis conducting health education program in various committees to give awareness to the people.

Nursing Practice

- Nurses as person-oriented and competent professionals have responsibilities to promote health information regarding DM.
- All public health nurses should disseminate the proper information regarding DM. This will help increase public awareness and promote healthy practices. This further leads to a better quality of life.

Nursing Administration

- Nursing administrations should be taking the initiative in organizing various health programs and health education regarding DM.
- Appropriate teaching–learning materials regarding DM can be made and appropriate information and providing structured teaching program to improve their knowledge and practice levels.

Nursing Research

- Research on nursing students' knowledge regarding DM should be carried out continuously to assess the knowledge and practice levels for upgrading their knowledge and practice levels.

- The study also indicates that there is lack of knowledge regarding DM. In comparison to other health aspects, there is a requirement for in-depth and extensive nursing research, along with evidence-based practice measures. The data presented in this study can help in future studies.

Limitations

- The size of the sample was small. Hence it restricted generalization.
- The samples were drawn from a selected rural community at Guntur district. So, the wider generalization was limited.

Recommendations

The following are the some of the recommendations for further studies:

- Replication of the study can be done with large samples in different settings to validate and generalize the findings.
- A longitudinal study could be conducted to assess the impact of simulation-based learning on staff nurses' understanding of diabetes mellitus.
- The same study can be conducted with an experimental research approach having a control group on large samples.
- A study can be conducted by using other methods like computers, assisted instructions, audio, and video tapes to find out the best strategy in teaching this group of staff nurses and nursing students.
- A study can be conducted to compare the knowledge attitude and practice of nursing students about DM.

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