International Journal of General Practice Nursing, 2024, Volume 2, Issue 3
https://ojs.bbwpublisher.com/index.php/IJGPN
ISSN Online: 2981-9423
ISSN Print: 2981-9415

The Influence of Socioeconomic Factors on Diabetes Management and Its Outcomes

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Abstract: Diabetes is a growing global issue, with socioeconomic status (SES) influencing diabetes incidence and prevalence. Adults with low incomes are more likely to have diabetes and have higher rates of complications and mortality. Education quality is more important than quantity in SES assessments. High-income individuals are less likely to experience diabetes due to the affordability of balanced diets and medications. Long work hours and illiteracy also contribute to diabetes. Research in Bahawalpur, Pakistan, found that socioeconomic factors significantly influence diabetes patients, with poor economic and diabetic education being more common. Physical activity and lack of life insurance also contribute to diabetes. In Bahawalpur, a cross-sectional study of the influence of socioeconomic factors on diabetes management and outcomes across age and gender groups, involving 374 participants from various social and economic backgrounds was carried out. The questionnaire results show that 60% of the participants were male and 39.39% were female. The participants over the age of 50 make up 66.80% of the total number. Among the 374 participants, 236 (63.10%) were jobless. 41.97% of participants had poor knowledge about diabetes. The participants have poor diabetes management due to poor education, poor economics, and a lack of physical activities, thus having a negative influence on their lives.

Keywords: Diabetes; Socioeconomic factors; Knowledge; Bahawalpur; Pakistan

Online publication: September 6, 2024

1. Introduction

Diabetes is a rapidly increasing global disease impacting human health and affecting social and economic aspects of life. It is predicted that by 2045, there will be 693 million diabetics worldwide, up from 451 million in 2017 [1]. Additionally, it is estimated that 49.7% of individuals with type II diabetes are undiagnosed [2]. The average life expectancy of patients with type II diabetes is reduced by approximately ten years [3]. Most diabetes patients in developing nations are younger than 64, while in developed nations, the majority are older [2]. Between 2010 and 2030, the adult population in developing countries is anticipated to have a 69% increase in diabetes, compared to a 20% increase in developed countries [3–4].

Pakistan, a developing and low-income nation, is facing a widespread prevalence of diabetes. An

individual's or family's socioeconomic status (SES) is a comprehensive indicator of their financial and social standing [5]. Despite variations in socioeconomic status, literacy rates, education levels, cultural norms, and lifestyles, it is crucial to identify the primary factors affecting the lives of diabetic patients [6]. Various strategies can be applied to the socioeconomic factors of diabetic patients to achieve better outcomes and management of diabetes.

2. Methodology

This cross-sectional study was conducted from March 18, 2024, to May 30, 2024, at the outpatient and inpatient departments of medicine in the following hospitals: Bahawalpur Victoria Hospital (BVH), Bahawalpur Medical and Dental Hospital (BMDH), Sir Sadiq Abbasi (Civil) Hospital, Bahawalpur, Pakistan. The study also included students from the Islamia University of Bahawalpur (IUB) in the Information and Communication Technology Department and Bahawalpur College of Pharmacy (BCP) Bahawalpur. The inclusion criteria were diabetic patients of both genders and all ages. The exclusion criteria were non-diabetic patients, coma patients, or those unwilling to participate in the study. Data were collected from 374 diabetic patients for this cross-sectional descriptive study. The sample size was determined using the Raosoft calculator software. At the time of enrollment, the following information was recorded: gender, age, employment status, educational status, health insurance, diabetic knowledge, economic and social life of diabetic patients, and its influence on subjects and diabetes.

2.1. Study tool

The standardized questionnaire was employed as a data collection tool for the study. The questionnaire consisted of six types of questions. The first type gathered personal information such as age, gender, qualifications, and other demographic data. The second category included knowledge-based questions about diabetes. The third category gathered information about the economic status of patients. The fourth type gathered information about social factors. The fifth type gathered information about diabetes management. The last type gathered information about the influence of socioeconomic factors on diabetic patients. The study questionnaire is shown below.

Public Healthcare Questionnaire of "The Influence of Socioeconomic Factors on Diabetes Management and Outcomes"

Name:_____ CNIC:_____

1) What is your age group?
   Under 20
   20–50
   Over 50
2) What is your gender?
   Male
   Female
   Other
3) Are you (a) literate_____ or (b) illiterate____. If (a) then answer the below question;
   Up to intermediate level
   Undergraduate
   Postgraduate

4) How would you describe your current employment status?
   Employed full-time
   Employed part-time
   Unemployed
5) Do you have health insurance?
   Yes, through employer
   Yes, through the government program
   No
6) How would you rate your household income?
   Low (below average)
   Average
   High (above average)
7) How often do you check your blood sugar level?
   Daily
   Weekly
   Monthly or less
8) Do you have access to healthy food options in your area?
   Yes, easily accessible
   Somewhat accessible
   Not accessible
9) Have you received proper diabetes education?
   Yes, comprehensive education
   Some education
   No education
10) How often do you engage in physical activity?
   Daily
   A few times a week
   Rarely or never
11) How many doctor visits related to diabetes do you have per year?
   1–2 visits
   3–5 visits
   More than 5 visits
12) Have you ever skipped medications due to cost?
   Yes, frequently
   Sometimes
   No, never
13) Do you have a support system for managing your diabetes?
   Yes, strong support
   Some support
   No support
14) Have you ever had to ration insulin or other diabetes medications?
   Yes, frequently
   Sometimes
   No, never

15) How would you rate your overall satisfaction with your diabetes management?
Very satisfied
Somewhat satisfied
Not satisfied
16) Are you aware of community resources available for diabetes management?
Yes, very aware
Somewhat aware
Not aware
17) Have you ever had to choose between paying for diabetes care and other essentials (e.g., rent, food)?
Yes, frequently
Sometimes
No, never
18) How often do you experience stress related to managing your diabetes?
Daily
Occasionally
Rarely
19) How knowledgeable do you feel about managing your diabetes?
Very knowledgeable
Somewhat knowledgeable
Not knowledgeable
20) Have you ever had to delay or skip medical appointments due to financial constraints?
Yes, frequently
Sometimes
No, never
21) How would you rate the availability of diabetes care facilities in your area?
Excellent
Adequate
Insufficient
22) Have you ever participated in a diabetes support group?
Yes, currently
Yes, in the past
No
23) Do you feel your healthcare provider understands your socioeconomic challenges in managing diabetes?
Yes, completely
Somewhat
No, not at all
24) How would you rate the affordability of your diabetes medications?
Affordable
Somewhat affordable
Not affordable
25) How do you perceive the impact of socioeconomic factors on your diabetes management?
Significant impact
Some impact
No impact

2.2. Scoring criteria

The evaluation criteria were adapted from standard studies on diabetes in Pakistan. The demographic details of 374 diabetic patients included gender (female and male), educational level, and employment status. Knowledge criteria were classified as poor knowledge (1–2 Yes answers), average knowledge (3 Yes answers), and good knowledge (4 Yes answers). The economic evaluation criteria were classified as poor economic status (1–2 Yes answers), average economic status (3 Yes answers), and good economic status (4–5 Yes answers).

3. Results

Out of a total of 374 patients, 226 (60%) were male, 147 (39.30%) were female, and 1 (0.26%) did not disclose their gender. Regarding age distribution, 27 (7.2%) were under 20 years old, 97 (25.90%) were between 20 and 50 years old, and 250 (66.80%) were over 50 years old. In terms of educational attainment, 231 (61.70%) had education up to intermediate level, 86 (22.90%) were undergraduates, and 57 (15.20%) were postgraduates. Regarding employment status, 96 (25.60%) were employed full-time, 42 (11.22%) were employed part-time, and 236 (63.10%) were unemployed. Among the 374 patients, 19 (5.80%) had employment-based health insurance, 24 (6.41%) had government health insurance, and 331 (88.50%) had no health insurance. The other collected data include diabetes knowledge (**Table 1** and **Figure 1**); economic status (**Table 2** and **Figure 2**); physical activities (**Table 3** and **Figure 3**); availability of diabetes care facilities (**Table 4** and **Figure 4**); number of doctor's visits (**Table 5** and **Figure 5**); overall management of diabetes (**Table 6** and **Figure 6**); influence of social and economic factors (**Table 7** and **Figure 7**).

Table 1. Diabetes knowledge

Diabetes education	Total	Percentage
Poor	157	41.97%
Average	128	34.22%
Good	89	23.79%

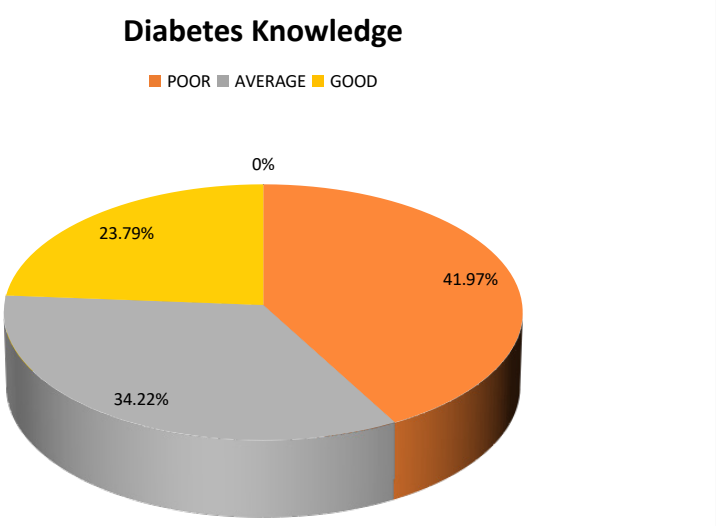

Figure 1. Diabetes knowledge: This figure illustrates the percentage of sample patients' knowledge of diabetes

Table 2. Economic status of the diabetic patients

Economics	Total	Percentage
Poor	152	40.64%
Average	126	33.68%
Good	96	25.66%

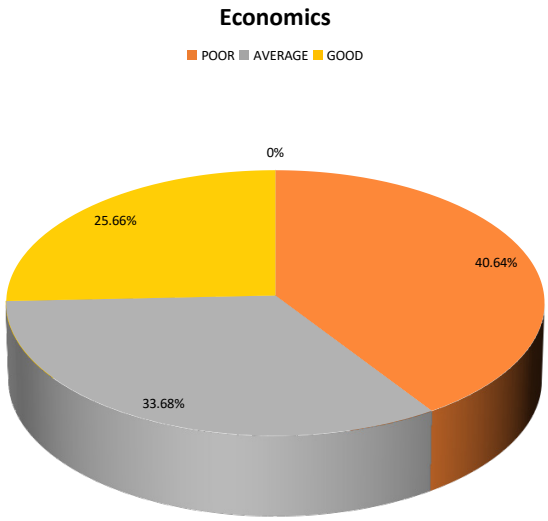

Figure 2. Economics: This figure illustrates the economic status of the total sample of diabetic patients

Table 3. Physical activities of the diabetic patient

Physical activities	Total	Percentage
Daily	54	14.43%
A few times a week	142	37.96%
Rarely	178	47.59%

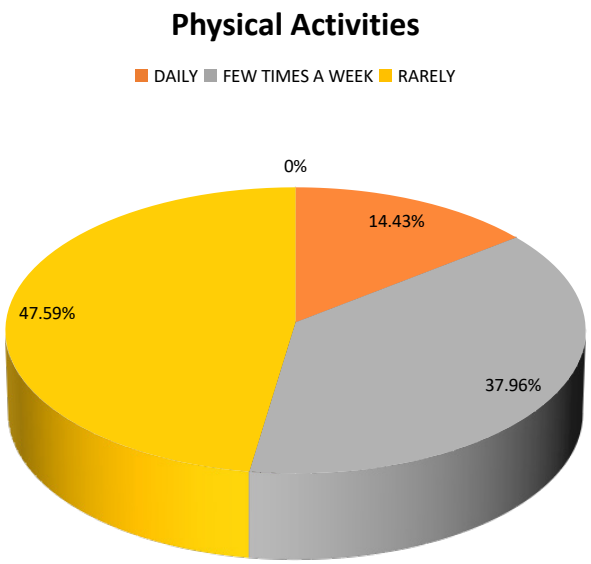

Figure 3. Physical activities of diabetic patients

Table 4. Availability of diabetes care facilities

Availability of diabetes care facilities	Total	Percentage
Excellent	205	54.81%
Adequate	97	25.93%
Insufficient	72	19.25%

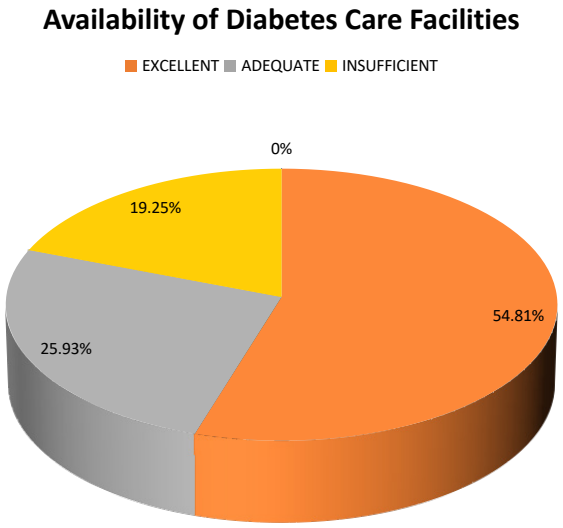

Figure 4. Availability of diabetes care facilities

Table 5. Doctor's visit per year

Doctor's visit per year	Total	Percentage
1 to 2	12	3.20%
3 to 5	39	10.42%
more than 5	323	86.36%

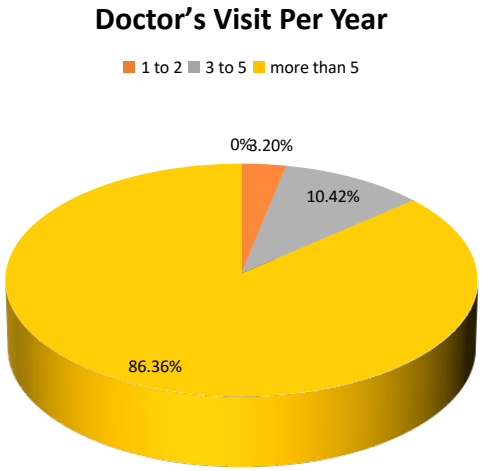

Figure 5. Doctor's visits of the diabetic patient

Table 6. Overall management of diabetes by patients

Overall management	Total	Percentage
Good	77	20.58%
Average	106	28.34%
Poor	191	51.06%

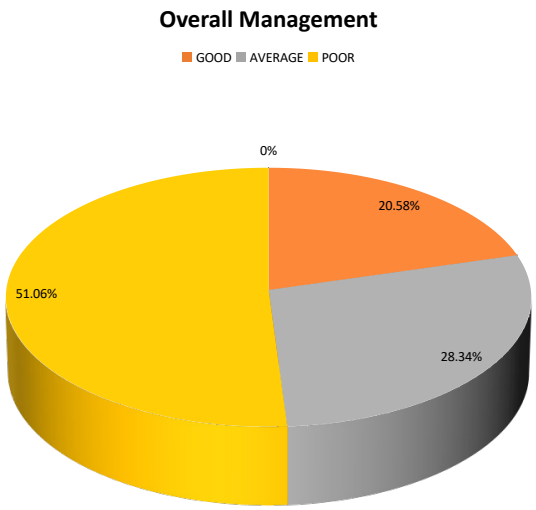

Figure 6. Overall management of diabetes by patients

Table 7. Influence of socioeconomic factors

Socioeconomic factors	Total	Percentage
Positive	84	22.45%
Neutral	143	38.23%
Negative	147	39.30%

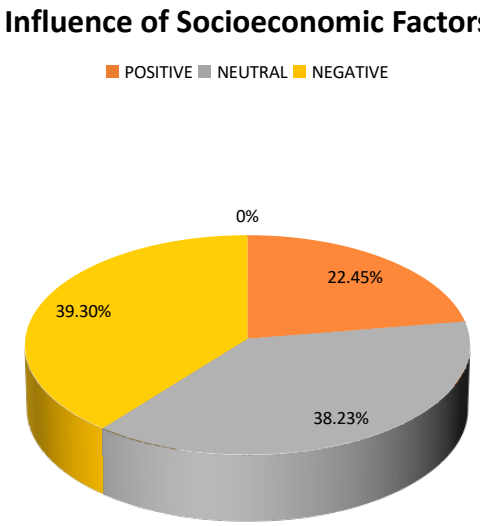

Figure 7. Influence of socioeconomic factors: This figure describes the influence of social and economic factors on diabetic patients, indicating whether the influence is positive, neutral, or negative

4. Discussion

Diabetes is increasingly becoming a serious issue in every nation worldwide. Socioeconomic status (SES) comprises education, occupation, and economic standing. Numerous studies over the years have shown that adults with lower incomes are more likely to have diabetes, along with higher rates of diabetes-related complications and mortality [7]. Diabetes incidence and prevalence rates correlate directly with occupation, income, and education levels. Educational attainment can be gauged by counting advanced degrees and years of schooling completed [8]. Quality of education is preferred over quantity in SES assessments. The prevalence of diabetes continues to increase as one descends from the highest to the lowest income levels [9]. Those with higher incomes are less likely to be affected by diabetes, as they can afford a balanced diet and medications. A meta-analysis by Kivimäki et al. found that individuals with low SES who work long hours (≥ 55 hours per week) are more prone to diabetes compared to those with regular work hours (35–40 hours per week), independent of high SES individuals [10]. A U.S. population-based survey reported higher diabetes prevalence among transportation workers compared to physicians [11]. Diabetes is not gender-specific; individuals with higher BMI are more susceptible to diabetes, and illiteracy also significantly affects poor glycemic control [6].

Research conducted in specific areas of Bahawalpur, Pakistan examined the impact of socioeconomic factors on diabetes patients. Findings revealed a significant influence of socioeconomic factors on diabetic patients. Diabetes is more prevalent among individuals with poorer economic and diabetic education compared to those with better economic and diabetic education. Physical activity is associated with a lower likelihood of diabetes. Individuals without life insurance are more likely to have diabetes than those with insurance. Moreover, socioeconomic factors exert a predominantly negative influence on diabetes.

5. Conclusion

This study aimed to explore the influence of socioeconomic factors on diabetic patients, irrespective of gender and age, in Bahawalpur. The findings conclude that socioeconomic status significantly impacts diabetic patients. Factors such as education, income, employment, and social status exert a notable influence on the prevalence and outcomes of diabetes. The findings suggest that patients from lower socioeconomic backgrounds are more likely to develop diabetes compared to those with higher socioeconomic status. Individuals with less knowledge about diabetes are particularly vulnerable to the disease. While diabetes is not gender-specific, socioeconomic status negatively impacts diabetes management. Future research should validate these findings through clinical assessments.

Disclosure statement

The authors declare no conflict of interest.

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