

# 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 the incidence and prevalence of the condition. Adults with lower incomes are more likely to develop diabetes and experience higher rates of complications and mortality. In SES assessments, education quality is considered more important than quantity. High-income individuals are less likely to develop diabetes due to their ability to afford balanced diets and medications. Long work hours and illiteracy also contribute to the onset of diabetes. Research conducted in Bahawalpur, Pakistan, found that socioeconomic factors significantly affect diabetes patients, with poor economic status and inadequate diabetic education being more prevalent. Physical inactivity and lack of life insurance further contribute to the condition. In Bahawalpur, a cross-sectional study involving 374 participants from diverse social and economic backgrounds examined the impact of socioeconomic factors on diabetes management and outcomes across different age and gender groups. Among the participants, 60% were male and 39.39% were female, with 66.80% over the age of 50. Out of the 374 participants, 236 (63.10%) were unemployed. Additionally, 41.97% of participants had limited knowledge about diabetes. Due to poor knowledge, economic constraints, and lack of physical activity, participants experienced poor diabetes management, leading to negative outcomes.

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

**Online publication:** December 30, 2024

## 1. Introduction

Diabetes is a rapidly increasing global disease that impacts human health and has significant social and economic

consequences. It is predicted that by 2045, the number of diabetics worldwide will rise to 693 million, up from 451 million in 2017 <sup>[1]</sup>. Additionally, it is estimated that 49.7% of individuals with type II diabetes remain undiagnosed <sup>[2]</sup>. The average life expectancy of individuals with type II diabetes is reduced by approximately ten years <sup>[3]</sup>. In developing countries, the majority of diabetes patients are younger than 64, while in developed nations, most patients are older <sup>[2]</sup>. Between 2010 and 2030, the adult population in developing countries is expected to experience a 69% increase in diabetes prevalence, compared to a 20% increase in developed countries <sup>[3,4]</sup>.

Pakistan, a developing and low-income nation, is experiencing a widespread prevalence of diabetes. An individual's or family's socioeconomic status (SES) serves as a comprehensive indicator of their financial and social standing <sup>[5]</sup>. Despite variations in SES, literacy rates, education levels, cultural norms, and lifestyles, it is essential to identify the key factors affecting the lives of diabetic patients <sup>[6]</sup>. Various strategies targeting the socioeconomic factors of diabetic patients can lead to better management and improved outcomes for those living with 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), and Sir Sadiq Abbasi (Civil) Hospital, Bahawalpur, Pakistan. The study also included students from the Information and Communication Technology Department of the Islamia University of Bahawalpur (IUB) and the 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, and 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

A standardized questionnaire was employed as a data collection tool for the study. The questionnaire consisted of six categories of questions. The first category 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 category collected data on social factors. The fifth category focused on diabetes management. The final category gathered information on the influence of socioeconomic factors on diabetic patients. Below is the study questionnaire.

Public Healthcare Questionnaire of “The Influence of Socioeconomic Factors on Diabetes Management and Its Outcomes”

Name: \_\_\_\_\_

CNIC: \_\_\_\_\_

What is your age group?

- (i) Under 20
- (ii) 20-50
- (iii) Over 50

What is your gender?

- (i) Male
- (ii) Female
- (iii) Other

Are you (a) literate or (b) illiterate?

If (a), then choose the following:

- (i) Under intermediate
- (ii) Undergraduate
- (iii) Postgraduate

How would you describe your current employment status?

- (i) Employed full-time
- (ii) Employed part-time
- (iii) Unemployed

Do you have health insurance?

- (i) Yes, through employer
- (ii) Yes, through the government program
- (iii) No

How would you rate your household income?

- (i) Low (below average)
- (ii) Average
- (iii) High (above average)

How often do you check your blood sugar level?

- (i) Daily
- (ii) Weekly
- (iii) Monthly or less

Do you have access to healthy food options in your area?

- (i) Yes, easily accessible
- (ii) Somewhat accessible
- (iii) Not accessible

Have you received proper diabetes education?

- (i) Yes, comprehensive education
- (ii) Some education
- (iii) No education

How often do you engage in physical activity?

- (i) Daily
- (ii) A few times a week
- (iii) Rarely or never

How many doctor visits related to diabetes do you have per year?

- (i) 1–2 visits
- (ii) 3–5 visits
- (iii) More than 5 visits

Have you ever skipped medications due to cost?

- (i) Yes, frequently
- (ii) Sometimes
- (iii) No, never

Do you have a support system for managing your diabetes?

- (i) Yes, strong support
- (ii) Some support
- (iii) No support

Have you ever had to ration insulin or other diabetes medications?

- (i) Yes, frequently
- (ii) Sometimes
- (iii) No, never

How would you rate your overall satisfaction with your diabetes management?

- (i) Very satisfied
- (ii) Somewhat satisfied
- (iii) Not satisfied

Are you aware of community resources available for diabetes management?

- (i) Yes, very aware
- (ii) Somewhat aware
- (iii) Not aware

Have you ever had to choose between paying for diabetes care and other essentials (e.g., rent, food)?

- (i) Yes, frequently
- (ii) Sometimes
- (iii) No, never

How often do you experience stress related to managing your diabetes?

- (i) Daily
- (ii) Occasionally
- (iii) Rarely

How knowledgeable do you feel about managing your diabetes?

- (i) Very knowledgeable
- (ii) Somewhat knowledgeable
- (iii) Not knowledgeable

Have you ever had to delay or skip medical appointments due to financial constraints?

- (i) Yes, frequently
- (ii) Sometimes
- (iii) No, never

How would you rate the availability of diabetes care facilities in your area?

- (i) Excellent
- (ii) Adequate
- (iii) Insufficient

Have you ever participated in a diabetes support group?

- (i) Yes, currently
- (ii) Yes, in the past
- (iii) No

Do you feel your healthcare provider understands your socioeconomic challenges in managing diabetes?

- (i) Yes, completely
- (ii) Somewhat
- (iii) No, not at all

How would you rate the affordability of your diabetes medications?

- (i) Affordable
- (ii) Somewhat affordable
- (iii) Not affordable

How do you perceive the impact of socioeconomic factors on your diabetes management?

- (i) Significant impact
- (ii) Some impact
- (iii) No impact

## 2.2. Scoring criteria

The evaluation criteria were adapted from standard studies on diabetes in Pakistan. The demographic details of the 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

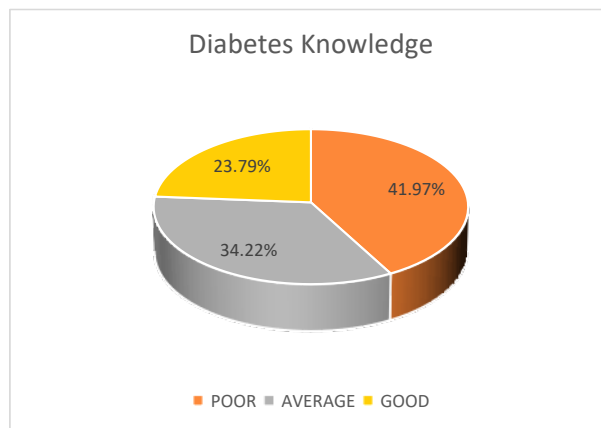
Out of a total of 374 patients, 226 (60%) were male, 147 (39.30%) were female, and 1 (0.26%) did not disclose their gender. Regarding age distribution, 27 (7.2%) were under 20 years old, 97 (25.90%) were between 20 and 50 years old, and 250 (66.80%) were over 50 years old. In terms of educational attainment, 231 (61.70%) had education up to the 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.

**Table 1. Diabetes knowledge**

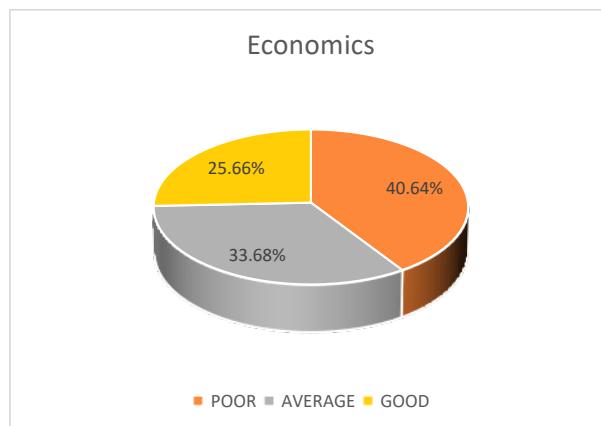
Diabetes education	Total	Percentage
Poor	157	41.97%
Average	128	34.22%
Good	89	23.79%



**Figure 1. Diabetes knowledge**

**Table 2. Economics**

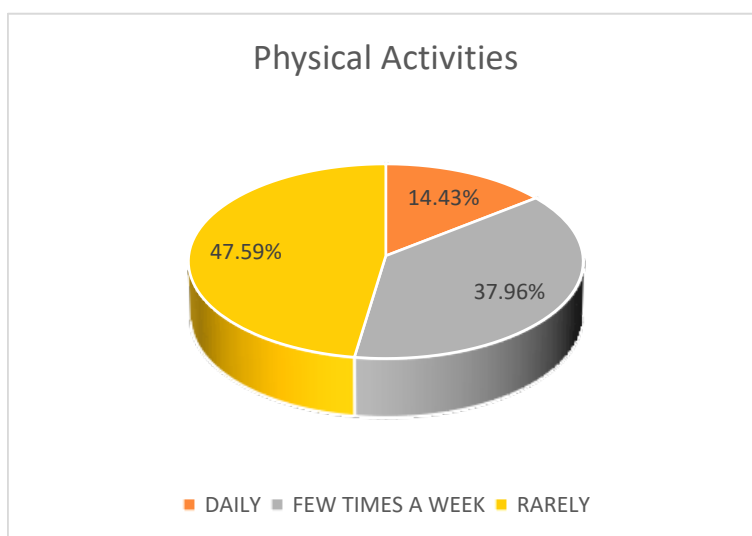
Economics	Total	Percentage
Poor	152	40.64%
Average	126	33.68%
Good	96	25.66%



**Figure 2. Economics**

**Table 3.** Physical activities of diabetic patients

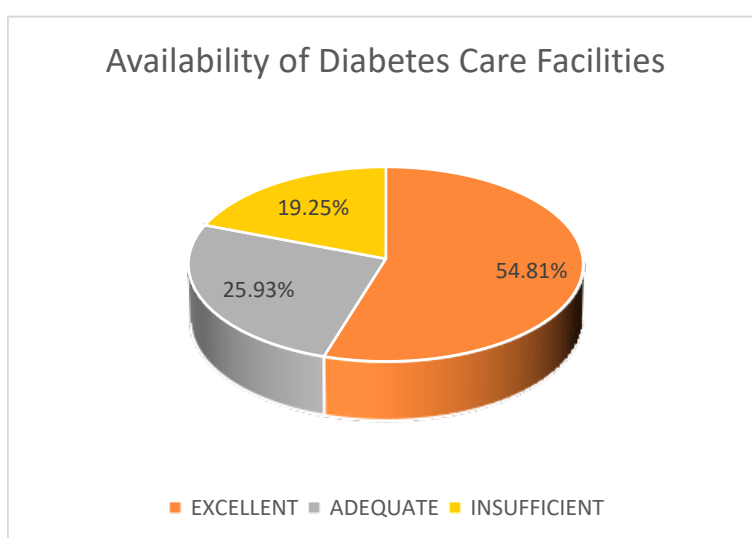
Physical activities	Total	Percentage
Daily	54	14.43%
Few times a week	142	37.96%
Rarely	178	47.59%



**Figure 3.** Physical activities of diabetic patients

**Table 4.** Availability of diabetes care facilities

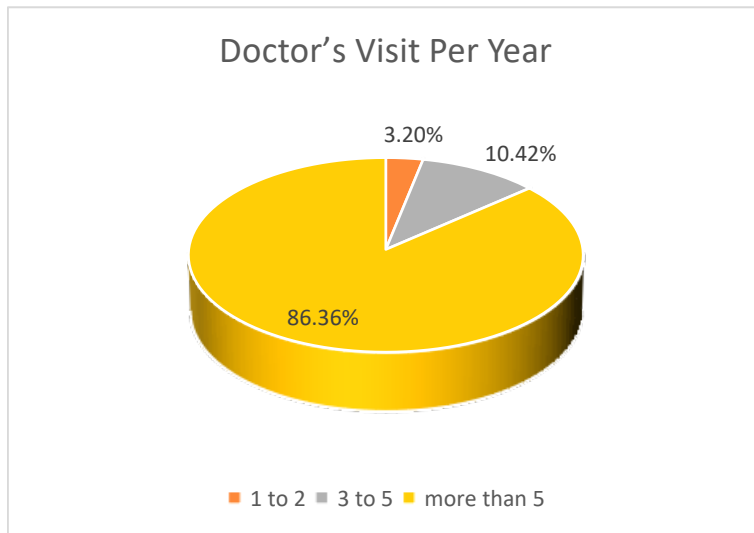
Availability of diabetes care facilities	Total	Percentage
Excellent	205	54.81%
Adequate	97	25.93%
Insufficient	72	19.25%



**Figure 4.** Availability of diabetes care facilities

**Table 5.** Doctor’s visit per year

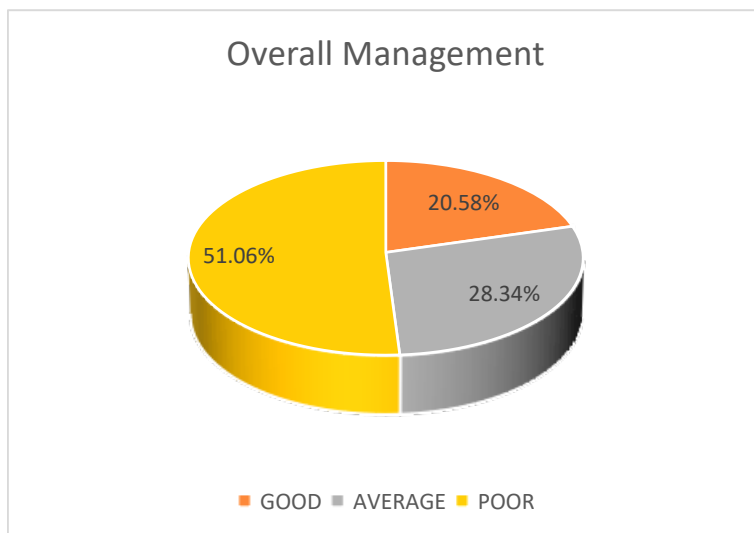
Doctor’s visit per year	Total	Percentage
1 to 2	12	3.20%
3 to 5	39	10.42%
More than 5	323	86.36%



**Figure 5.** Doctor’s visits of diabetic patients per year

**Table 6.** Overall management of diabetes by patients

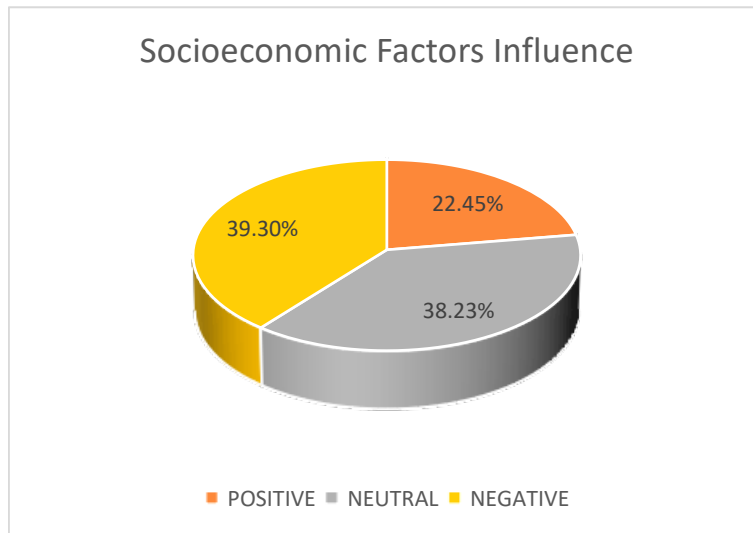
Overall management	Total	Percentage
Good	77	20.58%
Average	106	28.34%
Poor	191	51.06%



**Figure 6.** Overall management of diabetes by patients

**Table 7.** Socioeconomic factors influence

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



**Figure 7.** Socioeconomic factors influence

The results of the study reveal several key findings regarding the socioeconomic and diabetes management factors among the 374 diabetic patients. In terms of diabetes education, 41.97% of participants had poor knowledge, 34.22% had average knowledge, and 23.79% had good knowledge (Table 1 and Figure 1). Economic status showed that 40.64% of participants were classified as having poor economic status, 33.68% had an average economic status, and 25.66% had good economic status (Table 2 and Figure 2). Regarding physical activity, 47.59% of participants engaged in physical activity rarely, 37.96% exercised a few times a week, and only 14.43% were physically active daily (Table 3 and Figure 3). The availability of diabetes care facilities was rated as excellent by 54.81% of the participants, while 25.93% considered the facilities adequate and 19.25% found them insufficient (Table 4 and Figure 4). In terms of doctor visits, 86.36% of patients visited a doctor more than five times a year, while 10.42% made 3–5 visits, and only 3.20% visited a doctor 1–2 times per year (Table 5 and Figure 5). Diabetes management was poor in 51.06% of patients, with 28.34% reporting average management and 20.58% indicating good management (Table 6 and Figure 6). Finally, socioeconomic factors were perceived to have a negative influence on diabetes management for 39.30% of patients, while 38.23% felt these factors had a neutral impact, and 22.45% believed they had a positive influence (Table 7 and Figure 7).

#### 4. Discussion

Diabetes is increasingly becoming a serious issue worldwide. Socioeconomic status (SES), which includes education, occupation, and economic standing, plays a significant role in diabetes incidence and prevalence. Numerous studies have shown that adults with lower incomes are more likely to have diabetes and experience

higher rates of diabetes-related complications and mortality <sup>[7]</sup>. The incidence and prevalence of diabetes correlate directly with occupation, income, and education levels. Educational attainment, which can be measured by advanced degrees and years of schooling, is an important indicator of SES <sup>[8]</sup>. The quality of education is considered more significant than the quantity in SES assessments. The prevalence of diabetes increases as one moves from higher to lower income levels <sup>[9]</sup>. Individuals 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.* <sup>[10]</sup> found that individuals with low SES who work long hours ( $\geq 55$  hours per week) are more prone to diabetes than those with regular work hours (35–40 hours per week), independent of high SES individuals. A U.S.-based survey <sup>[11]</sup> found higher diabetes prevalence among transportation workers compared to physicians. Diabetes is not gender-specific, and individuals with higher body mass index are more susceptible to the disease. Additionally, illiteracy significantly impacts poor glycemic control <sup>[6]</sup>.

Research conducted in Bahawalpur, Pakistan, has examined the impact of socioeconomic factors on diabetes patients. The findings revealed that socioeconomic factors significantly influence 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, and individuals without life insurance are more likely to have diabetes than those with insurance. Furthermore, socioeconomic factors exert a predominantly negative influence on diabetes.

## 5. Conclusion

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

## Disclosure statement

The authors declare no conflict of interest.

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