

## Awareness of Complications of Diabetes Mellitus Among Hospital Staff and Medical Trainees: A Questionnaire-Based Cross-Sectional Study

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### ABSTRACT

**Background:** Diabetes Mellitus is one of the most common chronic metabolic disorders worldwide and is associated with multiple microvascular and macrovascular complications. Healthcare professionals and trainees are expected to have adequate awareness regarding these complications to ensure early detection and management.

### Objective:

To assess the awareness of complications of Diabetes Mellitus among medical, dental and nursing students as well as hospital staff.

### Methods:

A cross-sectional questionnaire-based study was conducted among 300 participants including 100 MBBS medical students and interns, 50 BDS dental students, 50 nursing students, and 100 hospital staff (nurses and technicians). The study was conducted across two medical colleges, two dental colleges, three nursing colleges and one private hospital in India. A structured 15-item Likert scale questionnaire assessing awareness of diabetic complications was used. Responses were recorded on a five-point Likert scale ranging from strongly disagree to strongly agree. Data were analyzed using descriptive statistics and chi-square tests.

### Results:

Overall awareness regarding common complications such as diabetic neuropathy and nephropathy was moderate to high among medical students (78%) but comparatively lower among hospital staff (56%). Knowledge regarding diabetic retinopathy was highest among MBBS students (82%) and lowest among technicians (48%). Awareness of macrovascular complications such as cardiovascular disease was moderate across all groups (65%). Significant differences were observed between participant groups ( $p < 0.05$ ).

### Conclusion:

Although healthcare trainees showed better awareness compared to hospital staff, gaps remain regarding long-term complications of Diabetes Mellitus. Periodic educational programs and continuing medical education (CME) sessions are recommended to improve knowledge among healthcare workers.

**Keywords:** Diabetes Mellitus, awareness, complications, healthcare trainees, hospital staff, questionnaire study.

## 1. INTRODUCTION

Diabetes Mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia due to defects in insulin secretion, insulin action, or both. The global burden of diabetes continues to rise, making it a major public health concern.

India is considered the **diabetes capital of the world**, with millions affected by the disease. Uncontrolled diabetes can lead to several **microvascular complications** such as neuropathy, nephropathy, and retinopathy, as well as **macrovascular complications** including cardiovascular disease and stroke.

Healthcare professionals play a crucial role in the early identification and management of these complications. Therefore, adequate awareness among healthcare trainees and hospital staff is essential.

This study was conducted to evaluate the level of awareness regarding complications of Diabetes Mellitus among medical students, dental students, nursing students, and hospital staff.

## 2. SPECIFIC OBJECTIVES:

### Primary Objective

To assess awareness regarding complications of Diabetes Mellitus among healthcare trainees and hospital staff.

### Secondary Objectives

1. To compare awareness levels between medical, dental and nursing students.
2. To assess awareness among hospital staff including nurses and technicians.
3. To identify gaps in knowledge regarding diabetic complications.

## 3. METHODOLOGY:

### Study Design

Cross-sectional questionnaire-based study.

### Study Setting

The study was conducted in:

- 2 Medical Colleges
- 2 Dental Colleges
- 3 Nursing Colleges
- 1 Private Hospital

### Study Participants

Total **300** participants

Participant Group	Number
MBBS Medical Students & Interns	100
BDS Dental Students	50
Nursing Students	50
Hospital Staff (Nurses & Technicians)	100
<b>Total</b>	<b>300</b>

### Inclusion Criteria

- Students enrolled in medical, dental or nursing colleges

- Hospital nurses and laboratory technicians
- Participants willing to provide informed consent

**Exclusion Criteria**

- Participants unwilling to participate
- Incomplete questionnaires

**Ethical clearance:** Not deemed to be necessary.

**Questionnaire (15-Item Likert Scale)**

Responses:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

1. Diabetes Mellitus can lead to serious long-term complications.
2. Diabetic neuropathy is a common complication of diabetes.
3. Diabetes can cause kidney damage (diabetic nephropathy).
4. Diabetes can lead to eye disease such as diabetic retinopathy.
5. Uncontrolled diabetes increases risk of heart disease.
6. Diabetes can increase risk of stroke.
7. Diabetic patients may develop foot ulcers.
8. Early screening helps prevent diabetic complications.
9. Regular blood sugar monitoring reduces risk of complications.
10. Lifestyle modification helps prevent diabetic complications.
11. Obesity increases risk of complications in diabetes.
12. Hypertension worsens diabetic complications.
13. Poor glycemic control increases risk of nerve damage.
14. Patient education plays an important role in preventing complications.
15. Healthcare workers should receive regular training on diabetic complications.

**4. RESULTS****Participant Distribution (Pie Chart Representation)**

- MBBS students – 33%
- Hospital staff – 33%
- BDS students – 17%
- Nursing students – 17%

**Awareness of Major Diabetic Complications**

Complication	MBBS (%)	BDS (%)	Nursing (%)	Staff (%)
Neuropathy	80	72	68	55
Nephropathy	78	70	66	54

Complication	MBBS (%)	BDS (%)	Nursing (%)	Staff (%)
Retinopathy	82	69	71	48
Cardiovascular disease	75	65	63	57
Diabetic foot	84	71	73	59

**Bar Graph Interpretation**

Medical students showed the highest awareness across all complications, while technicians demonstrated the lowest awareness, particularly regarding diabetic retinopathy and nephropathy.

**Line Graph Interpretation**

A trend analysis indicated progressively higher awareness levels from technicians → nursing students → dental students → MBBS students.

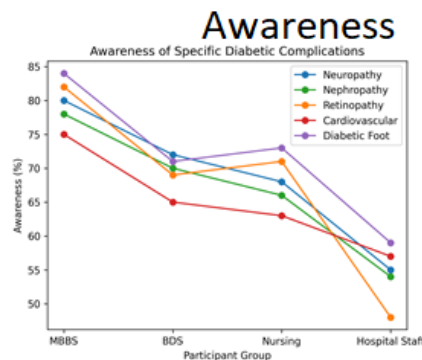
**Box Plot Interpretation**

Variation in awareness scores was highest among hospital staff, indicating inconsistent knowledge levels.

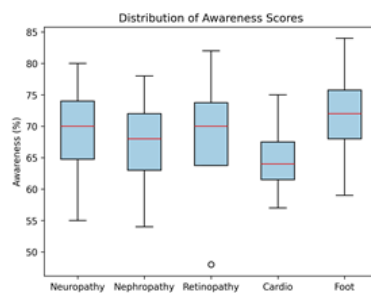
**Scatter Plot Interpretation**

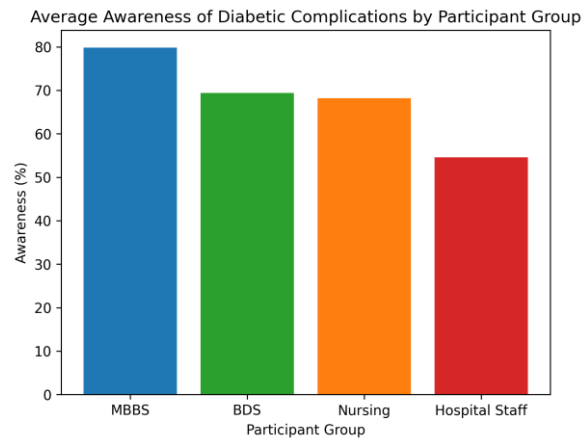
Positive correlation was observed between clinical exposure and awareness score.

**Line Chart – Complication**

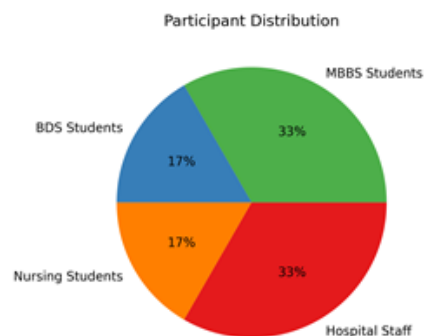


**Box Plot – Score Distribution**





## Pie Chart – Participant Distribution



## 5. DISCUSSION

The present study evaluated awareness of diabetic complications among healthcare trainees and hospital staff. Medical students showed better awareness compared with dental and nursing students, likely due to greater clinical exposure to diabetic patients. Similar findings were reported by previous studies where medical trainees demonstrated better knowledge regarding diabetic complications. Hospital staff, especially technicians, showed comparatively lower awareness levels. This highlights the need for regular educational interventions. Early identification of diabetic complications significantly reduces morbidity and healthcare costs. Therefore, structured training programs should be implemented in hospitals and healthcare institutions.

## 6. STRENGTHS OF THE STUDY

- Inclusion of multiple healthcare disciplines
- Large sample size (300 participants)
- Multi-institutional study design

## 7. LIMITATIONS

- Self-reported questionnaire responses may introduce bias
- Conducted in limited institutions

- Did not assess clinical competency

## 8. RECOMMENDATIONS

1. Conduct regular CME programs on diabetes management.
2. Introduce interdisciplinary training modules for healthcare workers.
3. Promote patient education programs on diabetic complications.
4. Include diabetes awareness workshops in healthcare curricula.

## 9. CONCLUSION

The study revealed moderate awareness regarding complications of Diabetes Mellitus among healthcare trainees and hospital staff. Medical students demonstrated the highest awareness levels, while hospital technicians showed comparatively lower knowledge. Continuous educational initiatives are necessary to bridge knowledge gaps and improve healthcare delivery for diabetic patients.

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