

Research

Evaluating Hyperglycaemia-Related Knowledge: A Cross-Sectional Survey

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Abstract:

Hyperglycaemia constitutes a core metabolic disturbance in diabetes mellitus and presents a growing concern for public health in India, particularly among younger populations. A cross-sectional survey was undertaken to evaluate awareness levels pertaining to hyperglycaemia, including its clinical manifestations, predisposing factors, and preventive strategies, among 270 pharmacy undergraduates aged 18-28 years at JBIT College of Pharmacy, Dehradun. Data collection spanned six months and utilized a pre-tested structured questionnaire administered via Google Forms. Analysis was performed using descriptive statistics. Among respondents, 70.4% were male and 29.6% were female. Results indicated that 86.3% of students possessed prior familiarity with hyperglycaemia, while 81.1% had previously encountered information about elevated blood glucose. Recognition of symptoms was considerable: 84.8% identified increased urinary frequency, 83.0% recognized excessive thirst, 80.4% noted blurred vision, and 77.8% identified fatigue. The connection between hyperglycaemia and diabetes was understood by 81.5% of participants. Concerning risk factors, 80.7% cited high sugar consumption, 83.3% pointed to insulin dysfunction, and 80.7% acknowledged stress. Preventive knowledge was also notable, with 82.2% aware of the benefits of physical activity and 82.6% recognizing the importance of dietary management. The study concludes that pharmacy students at JBIT College demonstrate substantial awareness of hyperglycaemia and its features, reflecting adequate coverage within the existing pharmacy curriculum. Incorporating focused clinical training on patient counselling and early detection could further strengthen the preparedness of future pharmacists in diabetes care.[1-4]

Keywords: Blood Glucose, Health Knowledge, Pharmacy Education, Diabetes, Cross-sectional Survey, Uttarakhand

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INTRODUCTION

Diabetes mellitus ranks among the leading non-communicable disorders worldwide and is characterized by persistent hyperglycaemia due to impaired insulin secretion, insulin resistance, or both. According to the International Diabetes

Federation's 2021 Atlas, 537 million adults between 20-79 years are currently affected by diabetes, with numbers expected to reach 783 million by 2045. India contributes substantially to this global burden and is frequently referred to as the "diabetes capital" of the world. The ICMR-INDIAB national study in

2023 documented a diabetes prevalence of 11.4% across India.[1][5][6][7]

Hyperglycaemia is clinically defined as fasting plasma glucose levels of 126 mg/dL or higher and represents the hallmark biochemical abnormality in diabetes. Prolonged hyperglycaemia contributes to microvascular damage such as retinopathy and nephropathy, alongside macrovascular events including cardiovascular disease.[8-10] Prompt identification of hallmark symptoms—polyuria, polydipsia, polyphagia, fatigue, and visual disturbances—is essential for early intervention and complication prevention.[1]

The role of pharmacists extends beyond dispensing to include therapeutic management, health education, and community screening for chronic conditions like diabetes. Both the World Health Organization and the International Pharmaceutical Federation advocate greater pharmacist engagement in non-communicable disease management. Assessing awareness of hyperglycaemia among pharmacy students therefore provides insight into the readiness of the future healthcare workforce.[3][4][2]

Although diabetes prevalence is increasing in younger Indian adults, limited evidence exists on hyperglycaemia awareness among college students in Uttarakhand. The present survey was designed to examine knowledge levels regarding hyperglycaemia among pharmacy students aged 18-28 years at JBIT College, Dehradun, with the aim of identifying curricular gaps.

METHODOLOGY

Study Design: This was an institutional cross-sectional observational survey.

Setting and Duration: The investigation was conducted at JBIT College of Pharmacy, Dehradun, Uttarakhand, over a six-month period.

Sample and Sampling: A total of 270 pharmacy students were recruited through convenience sampling. Sample size estimation assumed 50% awareness prevalence, 95% confidence interval, and 6% margin of error.

Inclusion Criteria:

- Students 18-28 years of age
- Currently enrolled in pharmacy programs at JBIT College
- Provision of informed consent.

Exclusion Criteria:

Non-consenting students were excluded.

Study Instrument: A pre-tested structured questionnaire was distributed via Google Forms. It contained two sections: Section A collected demographic details, and Section B comprised 17 items evaluating knowledge of hyperglycaemia definition, symptoms, risk factors, and prevention.

Data Collection: Following Institutional Ethics Committee approval, informed consent was obtained. The Google Form link was shared with participants after briefing them on study objectives and confidentiality measures.

Statistical Analysis: Responses were compiled in Microsoft Excel 2019. Frequency and percentage distributions were calculated. Findings are presented in tabular form.

RESULTS

Participant Demographics:

Among 270 respondents, 190 (70.4%) were male and 80 (29.6%) were female. The largest proportion fell within the 21–23-year age bracket (Table 1).

Table 1: Demographic Characteristics of Participants (N=270)

Variable	Category	n	%
Gender	Male	190	70.4
	Female	80	29.6
Age (years)	18-20	65	24.1
	21-23	142	52.6
	24-26	48	17.8
	27-28	15	5.5
Academic Year	1st Year	52	19.3
	2nd Year	68	25.2
	3rd Year	74	27.4
	4th Year	76	28.1

Baseline Awareness:

A total of 233 (86.3%) participants indicated prior familiarity with hyperglycaemia, and 219 (81.1%) had heard of high blood sugar (Table 2).

Table 2: Baseline Awareness of Hyperglycaemia Among Participants (N=270)

Item	Yes n (%)	No n (%)
Familiar with term hyperglycaemia	233 (86.3)	37 (13.7)

Heard of high blood sugar previously	219 (81.1)	51 (18.9)
Aware hyperglycaemia links to diabetes	220 (81.5)	50 (18.5)

Symptom Recognition:

The association between hyperglycaemia and diabetes was identified by 220 (81.5%) students. Increased urination was correctly recognized by 229 (84.8%), excessive thirst by 220 (83.0%), blurred vision by 217 (80.4%), and fatigue by 210 (77.8%) participants (Table 3).[1]

Table 3: Recognition of Hyperglycaemia Symptoms (N=270)

Symptom	Correctly Recognized n (%)	Incorrectly Recognized n (%)
Increased urination	229 (84.8)	41 (15.2)
Excessive thirst	220 (83.0)	50 (17.0)
Tiredness/Fatigue	210 (77.8)	60 (22.2)
Blurred vision	217 (80.4)	53 (19.6)

Risk Factor Awareness:

High sugar intake was identified as a cause by 218 (80.7%) students. Insulin dysfunction was noted by 225 (83.3%), and stress by 218 (80.7%) (Table 4).[5][8]

Table 4: Awareness of Hyperglycaemia Risk Factors (N=270)

Risk Factor	Aware n (%)	Unaware n (%)
High sugar consumption	218 (80.7)	52 (19.3)
Insulin dysfunction	225 (83.3)	45 (16.7)
Stress	218 (80.7)	52 (19.3)

Prevention Awareness:

Regular exercise was identified as beneficial by 222 (82.2%) students, and 223 (82.6%) acknowledged the role of dietary management. The importance of blood glucose monitoring was recognized by 217 (80.4%) (Table 5).[4]

Table 5: Awareness of Hyperglycaemia Prevention (N=270)

Preventive Strategy	Aware n (%)	Unaware n (%)
Physical exercise controls blood glucose	222 (82.2)	48 (17.8)
Dietary management prevents hyperglycaemia	223 (82.6)	47 (17.4)
Regular glucose monitoring is essential	217 (80.4)	53 (19.6)
Routine medical checkups are necessary	213 (78.9)	57 (21.1)

DISCUSSION

This survey demonstrated considerable awareness of hyperglycaemia among pharmacy students, with over 80% correct responses across key domains (Tables 2-5). This contrasts with community-based studies where public knowledge is often limited. Goyal and Choudhry observed only 29% adequate knowledge among diabetic patients in North India, underscoring the influence of professional education.[8]

The predominance of male participants (70.4%) reflects typical enrolment trends in pharmacy programs (Table 1). Strong identification of the classical symptom triad—polyuria 84.8%, polydipsia 83.0%, and blurred vision 80.4%—suggests effective teaching of diabetes pathophysiology. Awareness of insulin dysfunction at 83.3% indicates sound grasp of underlying mechanisms.[1]

These observations are consistent with Thomas et al., who reported superior disease knowledge among health science students compared to the general public. Al-Makari et al. similarly concluded that structured health education markedly enhances diabetes awareness. Nevertheless, 13.7% of students lacked basic familiarity (Table 2), suggesting scope for reinforcement. Strengths of this study include an adequate sample of 270. Limitations involve its single-institution nature and reliance on self-reported data.[9]

The results imply that existing pharmacy curricula successfully convey foundational diabetes knowledge. Addition of case-based training and counselling simulations could further address the

theory-practice gap for future pharmacists, in line with International Pharmaceutical Federation recommendations.[2][3]

CONCLUSION

Pharmacy undergraduates at JBIT College exhibited strong awareness of hyperglycaemia, including its symptoms, risk factors, and preventive approaches. More than 80% of participants correctly identified essential clinical features and correlations (Tables 3-5). The findings indicate that current pharmacy training adequately delivers core knowledge on diabetes. Incorporating focused modules on patient counselling and screening into the curriculum is advised to improve practical competence. This would equip future pharmacists to contribute effectively to diabetes care and health promotion, given India's substantial diabetes burden.[1][3][6][7]

ETHICS STATEMENT

Ethical approval: Not applicable. This is a literature review and did not involve human subjects.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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AUTHOR CONTRIBUTIONS

Author 1: Conception, design, drafting.

Author 2: Literature search, data extraction.

Author 3: Critical revision, final approval.

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