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Original Article

Impact of Educational Intervention on Knowledge, Attitude and Practice Towards Diabetes Mellitus among the Students of Pharmacy Profession of a College

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ABSTRACT

Background: The ever-increasing rise in the number of diabetic patients is alarming and needs immediate tackling as it is on the brink of reaching epidemic proportions. An interesting trend is the spurt in cases among the young adults, mainly for lifestyle reasons. An improvement in the awareness and the understanding of the disorder is a step towards reducing the incidence of the disease. As healthcare provider, pharmacist advice patients and members of the public on pharmaceutical matters pertaining to illnesses and medications. **Materials and Methods:** The present study evaluated the knowledge, attitude and practice of pharmacy students towards diabetes mellitus. A Google form questionnaire was prepared and distributed among the students. A total of 160 respondents were collected and educational intervention was administered to those students. Pre and post-intervention scores were statistically analyzed. **Results:** It was observed that there was a significant improvement in the three dimensions-knowledge, attitude and practice after the intervention. **Conclusion:** Regular educational interventions are needed to spread awareness of the disease and check its spread.

Keywords: Knowledge, Attitude, Practice, Diabetes mellitus.

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INTRODUCTION

A class of metabolic disorders known as diabetes mellitus is typified by hyperglycemia brought on by deficiencies in either insulin action or secretion, or both.[1]

According to estimates, 10.5% of persons in the world (536.6 million) aged 20 to 79 had diabetes in 2021; by 2045, that number is expected to rise to 12.2% (783.2 million). The prevalence of diabetes is highest in those between 75-79 years old, and it is comparable in both sexes. According to estimates, the prevalence in 2021 was greater in high-income nations (11.1%) than in low-income countries (5.5%) and in urban regions (12.1%) than in rural (8.3%). From 2021 till 2045, middle-income nations are predicted to have the largest proportionate rise in the number of diabetes cases (21.1%), in contrast to high (12.2%) and low income (11.9%) nations. The predicted cost of diabetes-related medical expenses worldwide was 966 billion USD in 2021 and is supposed to ascend to 1,054 billion USD by 2045.[2]

With over 62 million people in India already afflicted with the condition, diabetes is quickly becoming seen as a possible epidemic. With 31.7 million persons living with diabetes mellitus in 2000, India led the globe in this regard. Globally, the population affected by diabetes is expected to double from 2000 to 2030, with India experiencing the largest growth. According to projections, the number of Indians with diabetes mellitus is supposed to ascend significantly to 79.4 million by 2030.[3]

Indians are particularly susceptible to acquiring diabetes because of a high rate of family genetic aggregation, central obesity, insulin resistance, and changes in lifestyle brought on by urbanization.[4]

Diabetes may have a significant negative impact on the body's numerous organ systems and eventually cause major consequences. Diabetes-related complications fall into one of two categories: microvascular or macrovascular. Microvascular problems include retinal vascular disease, nephropathy, and nerve disease, which affect the eyes, nervous system and kidneys, respectively. Peripheral vascular disease, cerebrovascular and cardiovascular stroke are examples of macrovascular problems. Peripheral vascular disease can cause gangrene, amputation, and non-healing bruises or wounds. Additional concerns among pregnant women with diabetes include dental disease, decreased resistance to infections including pneumonia and influenza, macrosomia and other delivery difficulties.[5]

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Diabetes is thought to be the cause of 4.2 million deaths annually among persons aged 20 to 79. One in nine fatalities among individuals between age 20 and age 79 are thought to be related to diabetes.[6]

Age-standardized diabetes incidence and death rates increased over the research period in India; incidence rose to 317.02 from 199.14, and as a result, mortality increased to 27.35 from 199.14 per 100,000 people.[7]

One useful method for assessing baseline knowledge and behavioral practice is the KAP study. The pharmacy profession is essential to health education because it can help correct false information and misconceptions related to diabetes in the community. Thus, the study's objective was to evaluate how educational interventions affected pharmacy students' knowledge, attitudes, and practices about diabetes.[8]

The present study surveyed undergraduate pharmacy students of Eminent College of Pharmaceutical Technology, Kolkata, West Bengal on their knowledge, attitudes and practices about diabetes.

MATERIALS AND METHODS

The study was conducted among B. Pharm students of a private Pharmacy College of Barasat. The students were verbally briefed about the study prior to initiation.

An inclusion criterion was undergraduate pharmacy students of Eminent College of Pharmaceutical Technology. Exclusion criteria were ex-pharmacy students of Eminent College of Pharmaceutical Technology and outside college students.

A Google form of Knowledge Attitude Practice [KAP] questionnaire was prepared. The form link was distributed amongst ECPT B. Pharm students of 1st, 3rd, 5th and 7th semesters with the help of various social media platforms. They were directed to fill the online form, without taking any help from any source and to rely only on his/her knowledge. It was communicated to the students that 'accepting responses' shall remain open for 72 hr and after that the link would be closed. After 72 hr the link was closed and the pre-intervention results were collected. Then the correct answers with notes were distributed to the respondents and instructions were given that they should read those materials. For any doubts, they were free to contact the sender. Post the intervention one week later, again the same Google form was distributed to only those participants who had filled the form earlier. The same previous method and time line were followed.

Statistical Analysis

Statistical analysis was done in Graph Pad Prism software, version 4 (Graph Pad Inc., USA). Data were analyzed with Paired 't' test and a confidence level of 95% was taken. The outcomes of the educational intervention conducted before and after were compared (Tables 1-3).

RESULTS

College students studying undergraduate pharmacy represented by both genders and all age groups were the participants. A total of 160 pharmacy students were respondents to the circulated KAP questionnaire on diabetes.

It was observed that intervention in the form of educational material caused statistically significant improvement in knowledge, attitude and practice parameters of the participants. Knowledge, attitude and practice parameters consisted of 7 questions. In the knowledge domain, most noticeable change was observed for question number 3 which assesses knowledge

Table 4: Knowledge Attitude Practice Assessment.

Knowledge	Pre-Educational Intervension (160 Nos.)		Post-Educational Intervesion (160 Nos.)	
	Correct Response	Percentage (%)	Correct Response	Percentage (%)
What is the main hormone responsible for regulating blood sugar levels in the body?	67/160	41.87%	160/160	100%
Which type of diabetes is characterized by an autoimmune response that destroys insulin producing cells in the pancreas?	31/160	19.37%	160/160	100%
Which of the following is a common symptom of high blood sugar in individuals with diabetes?	7/160	4.37%	160/160	100%
What is the recommend target range for fasting blood sugar levels for most adults with diabetes?	20/160	12.5%	160/160	100%

Knowledge	Pre-Educational Intervension (160 Nos.)		Post-Educational Intervesion (160 Nos.)	
	Correct Response	Percentage (%)	Correct Response	Percentage (%)
Which lifestyle factor can help manage diabetes and improve insulin sensitivity?	160/160	100%	160/160	100%
What is the term of a small device that delivers a continuous supply of insulin to people with Type 1 diabetes?	160/160	100%	160/160	100%
Which of the following should be monitored regularly by individual with diabetes to assess their long-term blood sugar control?	160/160	100%	160/160	100%
Attitude			--	
How important do you think it is for individuals with diabetes to monitor their blood sugar level regularly?	8/160	5%	160/160	100%
Do you believe that diabetes is a manageable condition with proper care and lifestyle changes?	39/160	24.37%	160/160	100%
How do you perceive the impact of stress on blood sugar control individual with diabetes?	18/160	11.25%	160/160	100%
Do you think someone with diabetes should follow a controlled diet?	72/160	45%	160/160	100%
It is important for a diabetic to maintain a healthy weight?	9/160	5.62%	160/160	100%
Do you think it is good to avoid extra added salts and sugar in your diet?	160/160	100%	160/160	100%
Missing medicines for a diabetic person have a negative effect on the disease control?	124/160	77.5%	160/160	100%
Practice			--	
Do you smoke everyday *	115/160	77.5%	0/160	0%
Do you intake food properly on time?	128/160	80%	160/160	100%
How much time do you spend for exercise per day?	81/160	50.62%	160/160	100%
Do you eat vegetables every day?	52/160	32.5%	160/160	100%
Do you check your blood glucose in every 6 months?	7/160	4.37%	160/160	100%
Do you eat fruits every day?	65/160	40.62%	160/160	100%
Do you drink alcohol every day? *	113/160	70.62%	0/160	0%

* Not taken for statistical purpose.

Table 1: Knowledge Numbers Statistics.

Paired *t* test	
p value	0.0340
p value summary	*
Are means signif. different? (*p* < *0.05)*	Yes
One-or two-tailed *p* value?	Two-tailed
t, d_f	t=2.734 d_f=6
Number of pairs	7
How big is the difference?	
Mean of differences	-73.57
95% confidence interval	-139.4 to -7.728
R squared	0.5548

Table 2: Attitude Numbers Statistics.

Paired *t* test	
p value	0.0049
p value summary	**
Are means signif. different? (*p* < *0.05)*	Yes
One- or two-tailed *p* value?	Two-tailed
t, d_f	t=4.333 d_f=6
Number of pairs	7
How big is the difference?	
Mean of differences	-98.57
95% confidence interval	-154.2 to -42.90
R squared	0.7578

Table 3: Practice Numbers Statistics.

Paired *t* test	
p value	0.0090
p value summary	**
Are means signif. different? (*p* < *0.05)*	Yes
One- or two-tailed *p* value?	Two-tailed
t, d_f	t=4.746 d_f=4
Number of pairs	5
How big is the difference?	
Mean of differences	-58.38
95% confidence interval	-92.52 to -24.23
R squared	0.8492

of common symptoms of the disease. Correct answer percentage increased from 4.37% to 100%, post educational intervention. In the attitude domain question number 6, regarding salt and sugar intake, everyone believed that cutting down extra intake of them is beneficial. This one was in pre-educational intervention, which suggest, that the respondents, have some knowledge regarding food habits. However, the most concerning attitude domain was illiteracy towards, regular measurement of blood sugar in diabetic patients. Only 8 respondents expressed their concern out of 160. Here after intervention, all 160 respondents agreed that basic monitoring should be a priority. Mixed responses were observed for practice domain questions. On one side, more than half of the respondents, 80% and 50.62% said that they eat food on time and exercise regularly, respectively, which are good habits which after educating them, all 160 respondents agreed to eat food timely and a minimum everyday exercise. On other side, eating vegetables daily (108 participants) or blood sugar test (153 participants) were off the list for these respondents. Intervention sowed into the minds of these participants the benefit of eating vegetables and going for blood test (Table 4).

DISCUSSION

The current study was carried out on pharmacy students through educational intervention evaluating Knowledge, Attitude and Practice (KAP) among pharmacy students in the context of diabetes mellitus. The study's findings indicated that Knowledge, Attitude and Practice (KAP) had improved after being exposed to an educational intervention. Students who knew less about diabetes mellitus were encouraged to embrace healthy habits and encourage positive behavior. Despite the very excellent results, there is evidence that they continue to become stronger in the wake of the disease. One practical and effective strategy for increasing awareness may be an educational intervention for pharmacy students. As a result, the research proved sound.

An interesting finding of the present study is the keenness of the pharmacy students to learn about the disorder and equip themselves thereby. This is a positive outcome, as able healthcare team can educate the population and help in curbing the diabetic epidemic.[9,10]

A study was conducted by Wajid *et al.* in Saudi Arabia regarding knowledge and attitude on diabetes mellitus. It included pharmacy students. 116 students filled the questionnaire. 85.2% respondents indicated that they know about the disease. 57.8% respondents believed that whatever risk is there regarding their health, respondents have little control over it. 23.2% respondents believed that getting the disease was not in their hands. 74.2% respondents believed that if they do some efforts from their side then that would minimize the risk of getting the disease. 77.6% respondents believed that if they could manage to either control of eliminate the risk of getting the disease then they won't suffer from diabetes. 69% respondents indicated that they possess the knowledge regarding the nature of diabetes. 56.9% respondents correctly indicated about the disease's age groups. 89.7% respondents indicated that they know which gender gets the disease most. 89.7% respondents know the duration of the treatment. 82.8% respondents knew that frequent urination

is a common sign of diabetic patient. Only 34.5% respondents believed that smoking is also a reason of getting the disease and one has to quit it for healthy life. Only 34.5% respondents could able to relate normal blood pressure with no diabetes statement. Only 29.3% respondents believed that one of the main complications of diabetes disease is stroke.[11]

A study was conducted by Bakshi *et al.* in India regarding knowledge on diabetes mellitus. It included pharmacy students. 330 students filled the questionnaire. 60% respondents agreed on cardiac problem and vision problems as complications of diabetes mellitus. Diabetes patients also suffer from infections. 182 students agreed on this statement. For 216 students diet counseling for diabetes patients is a must. According from 76% and 72% students' high blood pressure and kidney problems are complications of diabetes respectively. 76% respondents were aware of HbA_{1c} test. 70% respondents knew about RBS test. 62% respondents said that for glucose should be tested from blood.[12]

We have attempted to remove misconceptions and improve their knowledge through educational intervention, which will help them guard against diabetes mellitus.

As members of the healthcare team, pharmacy professionals and students should possess sufficient knowledge, attitudes, and practices about diabetes. To effectively combat diabetes, they ought to become engaged in raising public awareness of the disease.[9,10]

CONCLUSION

The KAP of pharmacy students towards diabetes may rise with the provision of specialized training and educational awareness.

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CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

ABBREVIATIONS

KAP: Knowledge, Attitude, Practice; **USD:** United States Dollar; **ECPT:** Eminent College of Pharmaceutical Technology; **INC:** Incorporated; **P:** Probability; **DF:** Degrees of freedom; **RBS:** Random blood sugar; **HbA_{1c}:** Glycated Haemoglogin.

SUMMARY

Pre and post academic experimental questionnaires were given to undergraduate pharmacy students in the current investigation, which was a potential experimental study with the goal of evaluating their knowledge, attitude, and practice of diabetes mellitus. Their feedback was then assessed. Present study helped understand the patient-oriented aspects of diabetes mellitus so that when they become registered pharmacists this study will aid them in patient counseling. It was inferred that post educational intervention; all participants had a better understanding of the disease condition and its various aspects. Hence the present study confirms the necessity of such knowledge up gradation from time to time which would positively aid the pharmacists in patient counseling.

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