

Impact of Nutrition Education Regarding Diabetes among Nursing Students

Zainab Imtiaz¹, Bahisht Rizwan², Sana Farooq³, Zainab Ameer⁴, and Shiza Butt⁵, Amsa Fatima⁶, Humaira Waseem⁷

^{1, 4, 5}(Student, University Institute of Diet and Nutritional Sciences, The University of Lahore, Lahore, Pakistan)

^{2, 3, 7}(Senior Lecturer/Dietitian, University Institute of Diet and Nutritional Sciences, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan)

⁶(Demonstrator, University Institute of Diet and Nutritional Sciences, The University of Lahore, Lahore, Pakistan)

Abstract:

Background: Nurses are the main component of the health care unit. They have the maximum interaction with patients in a hospital setting and giving nutrition education to nursing students about diabetes, in which diet plays a crucial role, can act as paramount in the treatment of diabetic patients. The objective of the study is to determine the impact of nutrition education on diabetes among nursing students from the Nursing Department of the University of Lahore.

Materials and Methods: A quasi-experimental study was conducted, with time duration of 4 months. The study was undertaken through pre-testing and post-testing using multi-sectional self-constructed questionnaires regarding demographics, knowledge, attitude, and practice. Data was collected from 50 female students of the nursing department of the University of Lahore, aged between 18 and 22 years. Non-probability convenient sampling technique used in the study for collection of data. A questionnaire on self-structure was used to collect data from participants. A written informed consent was taken from all the participating students. Pre-testing was conducted after that nutrition education program was conducted in which 12 lectures, activities and resource materials were given. After a gap of 2 weeks, post-testing was completed. Data was analyzed using SPSS version 24 and presented using tables and figures.

Results: It was concluded that nutrition education has a positive effect on the nursing students. Therefore nutrition education should be added in the courses of nursing students because nurses are the essential individuals in the health care unit and can play a crucial role in encouraging patients to bring about changes in the healthy lifestyle needed to reduce their illness. Nursing students of 19-20 years of age where 66% of them belong to urban areas and 33% to rural areas. For evaluation of their knowledge pre-testing was done to reveal that 59% of the nursing students lacked the knowledge about nutrition in diabetes. In pre-testing, 36% of the nursing student's attitude important towards glucose monitoring and after nutrition education, 86% of the students thought that glucose monitoring is essential. Moreover, in pre-testing, 34% of the nurses do not practice, that exercise can be helpful in the management of diabetes. In comparison, 66% said that it was not. After the nutrition education, 92% had the knowledge that exercise is helpful in the management of diabetes, and 8% said that it is not helpful.

Conclusion: It was concluded that nutrition education has a positive effect on the nursing students. So nutrition education should be added in the courses of nursing students because nurses are the essential individuals in the health care unit. It can play a crucial role in encouraging patients to bring about changes in the healthy lifestyle needed to reduce their illness.

Key Word: Diabetes, Nurses, Nutrition Education, Nursing Students.

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I. Introduction

Diabetes is a title given to a set of metabolic disorders featuring chronic hyperglycemia. The consequence is either impaired insulin secretion or decreased or more often diminished insulin efficacy.¹ Diabetes is a set of illnesses marked by high level of blood sugar level. Individuals with high blood sugar level are more prone to diseases and impermanence as compared to a person with a normal blood sugar level. The worldwide pervasiveness of diabetes in grown-up has been expanding over the late decades. About 463 million people living with diabetes worldwide.² Through current inspections a rise in ubiquity of diabetes ingrown-ups from 4% to 6.4% by 2025 has been speculated that accounts for 380 million adults.¹ The outbreak of diabetes is one of the most daunting health concerns of 21st century, mainly in the developing countries.

An increase of 67% in the pervasiveness of diabetes from 2010 to 2030 is estimated. According to the first national diabetes survey of Pakistan, the impairment of blood glucose accounts for 22.04% in metropolitan and 17.15% in remote areas. A survey conducted in Punjab and Sindh reported the pervasiveness of diabetes accounts in between 13.1% to 26.9%. In remote areas of Baluchistan, diabetes prevalence has increased twofold from 7.2% to 14.2% in 7 years. Likewise, the pervasiveness of pre-diabetes has increased from 6.5% to 11%.³ Diabetes mellitus is a vast topic that is applied for a set of diseases that results in an increased blood glucose level. Categorization of diabetes includes Type 1, type 2 and gestational diabetes.⁴ Earlier known to be as insulin-dependent or juvenile diabetes and currently known as type 1 diabetes is an auto-immune disease where beta cells generated by the pancreas are demolished by the disease combating system of the human body.

Type 1 diabetes is an auto-immune disease that occurs when pancreatic cells that produce insulin are demolished by immune system.⁵ Type 1 diabetes was, to a great extent thought of as a disease of young children. However, this assessment has changed over the previous decade that age is no longer a restricting factor, and it can occur at any age. The onset of this type of diabetes is related to 3 features which are; excessive thirst, increased urination and increased hunger alongside a prominent trait, increased blood glucose level. In this type, external insulin substitution is promptly required. Even though type 1 diabetes can be analyzed at any age, it is a common long-term illness of childhood.⁶ Type 2 diabetes is way too diverse than it is thought to be in past times. It strikes 5%-10% of grown-ups and its pervasiveness is swiftly escalating with time. It is an illness that is described by features that include; fluctuation in insulin level and insulin insufficiency. This type can evolve at the paramount of two sequences; if the individual's beta cells fail to perform their function or his/her body has developed opposition towards insulin. The persistent metabolic unevenness which is linked with this disease can cause serious health hazard for the individual including heart disease.⁷ According to the estimation of international diabetes federation, and there are roughly 387 million people that have been detected by this illness all around the world.⁸

Type 2 of this disease is an escalating freight in underdeveloped areas. Coinciding, the pervasiveness of gestational diabetes is a severe and prevalent pregnancy-related problem. This condition is escalating to more than 30% within years, even in evolved and progressing areas of the world. Momentary and deep-rooted both unfavorable health concerning effects are linked to gestational diabetes not only to the mother but also to the newly born child. Furthermore, it may also indicate neglected existence of type 2 diabetes.⁹ The ubiquity of type 2 diabetes is 10 times more in women who had been previously identified with gestational diabetes, moreover hardening of arteries and heart disease hits more frequently to women with a background of gestational diabetes.¹⁰

Nutrition is a perceived determinant of many prolonged illnesses. However, the health workers are not educated or trained in providing dietary education and advising so the illness progression can be mediated and lightened. There is a convincing need to create nutritional information on medicinal service experts and to build up educational plans in the instruction, preparing and proceeding with training for health care professionals. Dietary education is more successful and constructive when given through different platforms as schools, workplaces, and broad communication and well-being centers. When nutritional knowledge is given to the nursing students, it gives them conviction and proves to be helpful in their job by giving precise and authentic dietary tips to the patients.¹¹ Because of the fact that extent of diabetes is vastly growing and is affecting people worldwide, to manage it and to provide awareness and education of patients through nurses is getting an immense hype in today's age.¹²

Nurses are the most significant individuals from the health services unit. Educational programs designed for them mostly lack nutrition-related knowledge, and there is a significant urgency for the improvement of nutritional knowledge of nurses. Dietary knowledge and efficiency will empower nurses and support patients and provide them with type 2 diabetes guidance for nutritional decisions that will help improve metabolic self-administration and personal satisfaction and make them independent in managing this long-lasting condition.

II. Material And Methods

A quasi-experimental study was conducted having a sample size of 50 nursing students, aged 18-22 years after 4 months. The study was conducted at the nursing department of the University of Lahore, Lahore.

Study Design: Quasi-experimental study.

Study Location: The nursing department of The University of Lahore teaching hospital, Lahore.

Study Duration: September 2019 to December 2019.

Sample size: 50 nursing students

Sampling Technique: Non-probability Convenient Sampling

Inclusion criteria:

1. Aged 18-22 years
2. Male and female students from the University of Lahore Teaching Hospital were selected.

Exclusion Criteria:

1. Non-cooperative individuals
2. Adults aged below 18 years and above 22 years
3. Nursing department besides The University of Lahore teaching hospital, Lahore

Procedure methodology:

The research process was initiated with the approval of the ethical committee of the university and after taking permission from the hospital and the nursing department to conduct the research; written informed consent was obtained from the nursing students before data collection. Data were collected by using a self-structured questionnaire. The research was performed by pre-testing and post-testing using multi-sectional self-constructed questionnaires regarding socio-demographics, knowledge, attitude, and practice.

Pre-testing questionnaires were given to the students to evaluate their knowledge, attitude and practices about dietary management of diabetes mellitus. For nutrition education program lectures, brochures, and lecture-based activities designed to educate nursing students. 12 lectures of 30 minutes each on different topics related to diabetes were arranged twice a week. At the end of the lecture, activities based on lectures were also used. A review of all lectures was given at the end of the session. Post-testing questionnaires were given after a gap of 2 weeks. All the information and data collected were kept confidential. Anonymity of the students was followed throughout the study.

Statistical analysis: The data analysis was done by using Microsoft Excel and SPSS version 24.0. Frequency, percentages were done to analyze the study. The results are shown in tables.

III. Result

According to table 1, showing the demographics of nursing students

Table no 1: Demographic data of nursing students

Gender	Male	0%
	Female	100%
Age	19 years	48%
	20 years	52%
Residential area	Rural	34%
	Urban	66%
Socioeconomic status	Lower class	16%
	Middle class	76%
	Upper class	8%
Parents Educational status	Uneducated	12%
	Educated	88%

According to the analysis of the study, 100% of the participants were females, 52% of the participants were age 19, and 48% were age 20. In the study 34% of the participants lived in rural areas, and 66% lived in urban areas, and 16% of the participants had a low socioeconomic status, 8% had high, and 76% had a moderate socioeconomic status. In the study, 88% of the parents of participants were educated, and 12% were uneducated.

Table 2: Frequency distribution about knowledge of normal sugar level

Normal sugar level	Pre n(%)	Post n(%)
Yes	18 (36)	50 (100)
No	32 (64)	0
Total	50 (100)	50 (100)

According to the results of table 2 in pre-testing, as shown in 36% of participants had the knowledge about value for normal sugar level, and 64% did not know. After the nutrition education, 100% of nursing students knew value for normal sugar level.

Table 3: Frequency distribution about knowledge of the link between obesity and diabetes

Obesity and Diabetes	Pre n(%)	Post n(%)
Yes	27 (54)	42 (84)
No	23 (46)	8 (16)
Total	50 (100)	50 (100)

According to table 3 in pre-testing, 54% of the nursing students had the knowledge about the relation of obesity with diabetes, and 46% did not know. After the education, 84% had the knowledge about the relation between obesity and diabetes, and 16% did not know.

Table 4: Frequency distribution about knowledge of a balanced diet

Balanced Diet	Pre n(%)	Post n(%)
Yes	26(52)	45(90)
No	24(48)	5(10)
Total	50(100)	50(100)

According to table 4 in pre-testing, 52% of students had knowledge about a balanced diet, and 48% did not know. After the education, the results of post-testing showed that 90% of students knew a balanced diet, and 10% did not know.

Table5: Frequency distribution about knowledge on prevention of foot ulcers by wearing bigger shoe size:

Shoe size and foot ulcers	Pre n(%)	Post n(%)
Yes	19(38)	31(62)
No	31(62)	19(38)
Total	50(100)	50(100)

According to pre-testing, 38% of the nursing students had the knowledge that wearing a shoe size bigger can help in preventing foot ulcer, while 62% said it would not prevent foot ulcers. In post-testing, 62% of the students had the knowledge that wearing a shoe size bigger will help prevent foot ulcers, and 38% did not know.

Table 6: Frequency distribution about the attitude towards the importance of regular glucose monitoring:

Glucose monitoring	Pre n(%)	Post n(%)
Yes	18(36)	43(86)
No	32(64)	7(14)
Total	50(100)	50(100)

According to table 4 pre-testing, 36% of the nursing students did not think that regular glucose monitoring is important, and 64% said that it is not important. After nutrition education, 86% of the students thought that regular glucose monitoring is important, and 14% did not think that.

Table 7: Frequency distribution about the attitude towards the restriction of cholesterol:

Restricting cholesterol	Pre n(%)	Post n(%)
Yes	17(34)	40(80)
No	33(66)	10(20)
Total	50(100)	50(100)

According to table 5 in pre-testing, 34% of the nursing students said that cholesterol should be restricted for a diabetic patient, and 66% said that it should not be restricted. After nutrition education, 80% of the students said that cholesterol should be restricted for diabetic patients, and 20% said that it should not be restricted.

Table 8: Frequency distribution about the attitude towards the importance of diet management:

Diet management	Pre n(%)	Post n(%)
Yes	30(60)	46(92)
No	20(40)	4(8)
Total	50(100)	50(100)

According to table 6 in pre-testing, 60% of the nursing students thought that diet management played an important role in diabetes, and 40% did not think that. In post-testing, 92% said that diet management is important, and 8% said that it was not.

Table 9: Frequency distribution about attitude towards effect of high-water intake in lowering blood sugar levels

Effect of high-water intake	Pre n(%)	Post n(%)
Yes	23(46)	41(82)
No	27(54)	9(18)

Total	50(100)	50(100)
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According to table 9, pre-testing results showed that 46% of participants thought high-water intake beneficial for diabetic patients, and 54% did not seem to agree. After providing them with nutritional education, the post-testing results showed that 82% of participants agreed with the thought of high-water intake beneficial for diabetic patients, and 18% of participants did not agree with it.

Table 10: Frequency distribution about practices of keeping track of carbohydrate intake

Track of carbohydrate intake	Pre n (%)	Post n (%)
Yes	19 (38)	40 (80)
No	31 (62)	10 (20)
Total	50 (100)	50 (100)

According to table 6 in pre-testing, 38% of the participants said that they keep a track for carbohydrate intake for diabetic patients, and 62% said that they did not. According to post-testing, 80% of the participants said that they keep a track for carbohydrate intake for diabetic patients, and 20% said that they did not.

Table 11: Frequency distribution about practices of recommending low glycaemic index foods

Recommending low glycaemic index foods	Pre n (%)	Post n (%)
Yes	18 (36)	44 (88)
No	32 (64)	6 (12)
Total	50 (100)	50 (100)

According to pre-testing, 36% of the participants said that they recommended intake of low glycaemic index foods to diabetic patients, and 64% said that they did not. According to post-testing, 88% of the participants said that they recommended intake of low glycaemic index foods to diabetic patients, and 12% said that they did not.

Table 12: Frequency distribution about practices of restricting trans-fat

Restricting trans-fat:	Pre n(%)	Post n(%)
Yes	21(42)	37(74)
No	29(58)	13(26)
Total	50(100)	50(100)

According to the table, pre-testing results showed that 42% of the participants said Yes to the practice of restricting fats for diabetic patients, and 58% of the participants said no to the practice. In post-testing, 74% of participants said Yes to the practice of restricting fats for diabetic patients, and 26% said no to the practice.

Table 13: Frequency distribution about practices of recommending whole grain foods

Recommending whole grain foods	Pre n(%)	Post n(%)
Yes	12(24)	39(78)
No	38(76)	11(22)
Total	50(100)	50(100)

According to the results of pre-testing, 24% of participants said yes to the practice of recommending whole-grain foods to the diabetic patients, and 76% of the participants said No to this practice. Post-testing results showed that 78% of the participants said yes to the practice of recommending whole-grain foods to the diabetic patients, whereas 22% of the participants said No to the practice.

IV. Discussion

The current study was conducted to reveal the effect of nutrition education on dietary management of diabetes on nursing student's knowledge, attitude, and practices. The range of nursing students is 52% 19 years, and 48% of nursing students were between 20 years. According to our study, 50 students were female, and there was no male student. According to our study, 88% of parents of nursing students were educated, and 12% were uneducated. According to our study, 66% of nursing students belonged to urban areas, and 34% were from rural areas. According to current study 16% of nursing students had low socio-economic status <100-000, 76% of

nursing students had moderate socio-economic status <15,000-20,000 and 8.0% of nursing students had high socioeconomic status <20,000-50,000.

The Present research demonstrate from pre-testing that 36% of nursing students knew the normal sugar level, whereas 64% of nursing students were not aware of the normal sugar level. However, after nutrition education, the awareness number drastically shot to 100%. A similar study conducted by *Abano et al.*, 2017 showed that students knew about the knowledge of normal sugar levels.¹³

The current study shows the results of pre-testing as, 38% of nursing students had knowledge about diabetic patients wearing shoes a size bigger than usual helps prevent foot ulcer and 62% nursing students had no knowledge about foot ulcer. After the nutrition education program, 62% of nursing students had knowledge that foot ulcer and 38% had still no knowledge that foot ulcer in post-testing. In a similar study, conducted by *M Afzal et al.*, 33% of nursing students had knowledge that foot ulcer.¹³

The preset research illustrate that shows the results of pre-testing as, 54% nursing students had knowledge that diabetes is related to obesity and 46% of nursing students said that there is no relation between diabetes and obesity but after the nutrition education program 84% nursing students answered that diabetes is related to obesity and 16% still said no in post-testing. *Laura Garcia-Molina et al.*, conducted a similar study, showed that diabetes could be controlled when weight loss is more than 5% than the initial BMI.¹⁴ The current study shows the results of pre-testing as 36% of nursing students believe that regular glucose monitoring is essential, and 68% of nursing students did not believe that regular glucose monitoring is essential. After the nutrition education program, 86% of nursing students believe regular glucose monitoring is important, and 14% of nursing students still did not believe that regular glucose monitoring is important in post-testing. A study conducted by *Beate Sjørgård RN et al.*, showed the effectiveness of glucose monitoring in the management of type 1 Diabetes.¹⁵

The current study shows the results of pre-testing as 34% of nursing students thought cholesterol should be restricted for a diabetic patient and 66% nursing students did not think cholesterol should be restricted for a diabetic patient. After the nutrition education program, an increase in knowledge was observed, and 80% of nursing students said cholesterol should be restricted, and 20% of nursing students still said no in post-testing. Another study conducted by *Victor Mogre et al.*, showed that 35.5% of nursing students thought that cholesterol should be restricted for diabetic patients.¹⁶ The current study shows that the results of pre-testing as 60% nursing students think that diet management plays a vital role in diabetes and 40% nursing students think opposite and after the nutrition education program 92% nursing students think that diet plays a vital role in diabetes and 8% do not believe in post-testing. *Mansoor Ghani et al.*, conducted a similar study, showed that 50% of nursing students thinking that diet management plays a vital role in diabetes.¹⁷

The present study shows the result of pre-testing as, 36% of nursing students would recommend low glycemic index food and 64% nurses would not recommend. After nutrition education program, 88% of nursing students would recommend low glycemic food and 12% of nurses would not recommend, in post-testing. In a similar study conducted by *Khan NA et al.*, revealed that result 70% of nursing students were recommended low glycemic or less sugary foods.¹⁷ The current study shows the results of pre-testing as 46% believe that high-intake of water has beneficial effects in lower blood sugar levels, and 54% did not believe in that. Post-testing results after nutritional education program shows that 82% of students believe the benefit of high-water intake for diabetic patients whereas 18% did not believe in that. A study performed by *Evan C. Johnson et al.*, showed the importance of high-water intake how it benefits people with type 2 diabetes.¹⁸

The preset research illustrate the result of pre-testing as 38% of nursing students would keep track of carbohydrate intake and 62% of nursing students would not practice keeping track of carbohydrate intake. After the nutrition education program, the post-testing result showed that 80% of nursing students would track the carbohydrate intake, and 20% of nursing students would not. A similar study was conducted by *Vedaste Bagweza et al.*, showed that only 10% of nurses knew about dietary requirements for diabetic patients, and 70% have never provided nutritional advice to patients with diabetes.¹⁹ The current study shows the result of pre-testing in which 24% of students would recommend whole-grain foods to the patient with diabetes, whereas 76% of students would not recommend. After providing the students with nutrition education about diabetes, the post-testing results showed an increase in the percentage of students to 78% who would recommend whole-grain foods to diabetic patients and 22% who would not. A study conducted by *Maria Ida Maiorino et al.*, showed the optimal dietary pattern for diabetes and the importance of whole grain foods.²⁰

V. Conclusion

This study was conducted to assess the impact of nutrition education on diabetes among nursing students. After providing the students with nutrition education through lectures, brochures and activities the knowledge related to normal sugar level, the relationship between diabetes and obesity, balanced diet and foot ulcer increased among nursing students. Their attitude towards glucose monitoring, high water intake, diet management and restriction of cholesterol for the management of diabetes also changed significantly. This

education program proved beneficial for nursing students in their practices, including whole-grain foods, low glycemic foods and tracking of carbohydrate intake as significant recommendations for diabetic patients.

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Conflict of interest:

There is no conflict of interest.

Ethical disclosure:

There is none to disclose.

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