

IMPACT OF NURSE-LED DIABETES DIET EDUCATION ON HEALTHY EATING KNOWLEDGE AMONG DIABETIC PATIENTS: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Introduction: Diabetes mellitus is a common chronic metabolic disorder requiring effective self-management to maintain optimal blood glucose levels and prevent complications. Healthy eating is a key component of diabetes management; however, many patients have inadequate knowledge regarding appropriate dietary practices. Nurse-led Diabetes Diet Education is an effective strategy to improve dietary knowledge and support self-management. This study assessed knowledge regarding healthy eating, evaluated the effectiveness of nurse-led Diabetes Diet Education, and determined the association between selected socio-demographic variables and knowledge among diabetic patients.

Materials and Methods: A quantitative quasi-experimental one-group pre-test and post-test design was adopted. The study was conducted among 100 diabetic patients selected through convenience sampling at a tertiary care teaching hospital. Data were collected using a structured knowledge questionnaire on healthy eating.

Results: Baseline assessment showed that 11% of participants had inadequate knowledge, 79% had moderately adequate knowledge, and 10% had adequate knowledge regarding healthy eating. Following nurse-led Diabetes Diet Education, 91% demonstrated adequate knowledge, 9% had moderately adequate knowledge, and none remained in the inadequate category. The mean knowledge score increased significantly from 15.14 ± 3.553 to 25.23 ± 2.781 ($t = -54.602$, $P < 0.001$), confirming the effectiveness of the intervention. Significant associations were observed between knowledge scores and age, educational status, occupation, dietary pattern, duration of diabetes, family history, and history of diabetes-related complications.

Conclusion: Nurse-led Diabetes Diet Education effectively improved knowledge regarding healthy eating among diabetic patients. Regular nurse-led dietary education can enhance dietary knowledge, promote effective diabetes self-management, and support improved health outcomes.

KEYWORDS: Diabetes mellitus, Type 2; Health Education; Knowledge; Nutrition Therapy.

INTRODUCTION

Diabetes mellitus affected around 537 million adults in 2021, with projections of 783 million by 2040.[1] Type 2 diabetes makes up over 85% of cases and is linked to urbanisation, sedentary lifestyles, unhealthy diets, obesity and ageing populations, especially in low-and middle-income countries. [2] India is witnessing a rise in diabetes prevalence, expected to reach around 80 million by 2030, particularly in Karnataka and Bengaluru, where a high burden of diabetes and prediabetes has been reported. [3, 4, 5]

Diabetes is associated with complications like cardiovascular disease, nephropathy, retinopathy, neuropathy, diabetic foot ulcers, and stroke, leading to increased healthcare costs and reduced quality of life. [1]

Effective management involves medication adherence, physical activity, glucose monitoring, medical nutrition therapy and dietary management. Medical nutrition therapy and dietary counselling are shown to improve glycaemic control, lipid profile and body weight. [6] However, many diabetic patients lack knowledge about healthy eating, portion control, and carbohydrate management. [7] Structured programs can enhance dietary knowledge and self-management, but there is limited context-specific research on the effectiveness of nurse-led dietary education in Indian hospital settings. [8, 9, 10] Indian diabetic patients face challenges, including cultural food habits and socioeconomic disparities and few studies have specifically examined nurse-led dietary education. [3, 4] Existing evidence indicates that educational interventions can significantly improve patients' understanding of dietary recommendations and support diabetes self-management. [8, 10] This study aims to provide valuable insights into nurse-led diabetes diet education for patients in Bengaluru.

MATERIALS AND METHODS

Study design: The research design selected for the study was quasi-Experimental one group pretest post-test Research design.

Study setting: The study was conducted in a tertiary care teaching hospital, Bengaluru. The criteria for selecting this setting were feasibility of conducting the study, availability of the samples and familiarity of the investigators with the setting.

Sampling: Clinically diagnosed cases of Type 2 diabetes in a tertiary care teaching hospital in Bengaluru who fulfilled the inclusion and exclusion criteria were selected.

Sampling technique: Non-probability convenience sampling technique was used to select 100 diabetic patients in a tertiary care teaching hospital, Bengaluru.

Sample size: The sample size for the study was 100 diabetic patients who fulfilled the inclusion and exclusion criteria.

Selection criteria

Inclusion criteria: Diabetic patients who are diagnosed with diabetes for at least 1 year, aged 18 years and above and willing to participate in the study.

Exclusion criteria: Patients who have already undergone structured Diabetes Diet Education programs and Pregnant women with gestational diabetes.

Ethical consideration: Ethical approval was obtained from the Institutional Ethics Committee before commencement of the study. Written informed consent was obtained from all participants. The study adhered to the Declaration of Helsinki.

Description of tool:

This tool consisted of two sections:

Section A: Socio-Demographic Data

It consists of Age, gender, educational status, occupation, dietary pattern, duration of diagnosis, complications, and Body Mass Index (BMI).

Section B: Structured knowledge Questionnaire on healthy eating with diabetes mellitus.

The questionnaire consists of 30 items, divided into 10 major components: healthy balanced diet, food recommendations, foods to avoid, glycaemic index, estimating portions, meal planning, special situations requiring modifications, shopping and reading labels, cooking at home, dining out.

Intervention:

The intervention consisted of a self-structured nurse-led Diabetes Diet Education program designed to improve diabetic patients' knowledge regarding healthy eating. The education was delivered individually using a PowerPoint presentation and interactive discussion in simple language, with each session lasting approximately 20–25 minutes. The programme covered key aspects of dietary management, including the importance of a healthy, balanced diet, recommended foods and foods to avoid, the glycaemic index, portion estimation, meal planning, dietary modifications during special situations such as hypoglycaemia, illness, and physical activity, shopping tips and reading food labels, healthy cooking practices, and dining out strategies. Participants were encouraged to actively participate by asking questions and clarifying their doubts throughout the session. The intervention emphasized adopting healthy eating habits to achieve optimal blood glucose control, prevent diabetes-related complications, and promote long-term self-management of diabetes.

Data collection:

Data collection was conducted from 28 January to 28 February 2026 after obtaining formal permission from the hospital authorities. A total of 100 diabetic patients meeting the predefined inclusion criteria were selected using non-probability convenience sampling. After obtaining written informed consent and ensuring confidentiality and anonymity, baseline knowledge was assessed using a structured questionnaire on healthy eating, requiring approximately 20–25 minutes to complete. Individualized nurse-led diabetes diet education was then provided using audio-visual aids, including a PowerPoint presentation. A post-test was conducted using the same questionnaire after a 7-day interval among the same participants. The collected data were entered into Microsoft Excel, coded, and analyzed using SPSS version 20.0.

Statistical analysis

Data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 20.0. Data will be analysed using descriptive and inferential statistics.

Descriptive Statistics

- Frequency and Percentage distribution were used to describe the socio-demographic variables.
- Frequency and Percentage were used to describe the diabetic patients' knowledge regarding healthy eating.
- Mean and standard deviation were used to analyse diabetic patients' knowledge regarding healthy eating.

Inferential statistics:

- Paired t-test was used to evaluate the effectiveness of nurse-led Diabetes Diet Education on knowledge regarding healthy eating among diabetic patients.
- Chi-square test was used to determine the association between selected sociodemographic variables and knowledge regarding healthy eating among diabetic patients.

This manuscript was prepared in accordance with the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) Statement.

RESULTS

Among the 100 diabetic patients, the majority were above 70 years of age (25%) and male (63%). Nearly one-third of the participants had completed high school education (29%), while 34% were retired. Most participants followed a non-vegetarian diet (74%), and 35% had been living with diabetes for 1–5 years. More than half (53%) reported no family

history of diabetes, and 63% had no history of diabetes-related complications. The majority (60%) had a normal body mass index (BMI). These socio-demographic characteristics are presented in Table 1.

Before the intervention, 79% of the participants had moderately adequate knowledge regarding healthy eating, while 11% had inadequate knowledge and only 10% had adequate knowledge. Following the nurse-led diabetes diet education programme, 91% of the participants demonstrated adequate knowledge and 9% had moderately adequate knowledge, with no participants remaining in the inadequate knowledge category, indicating a marked improvement in knowledge after the intervention. These findings are presented in Table 2.

The mean post-test knowledge score (25.23 ± 2.781) was considerably higher than the mean pre-test knowledge score (15.14 ± 3.553). The difference in mean knowledge scores before and after the nurse-led diabetes diet education programme was statistically significant ($t = -54.602$, $P < 0.001$), demonstrating the effectiveness of the intervention. Therefore, the research hypothesis (H_1) was accepted. These findings are presented in Table 3.

A statistically significant association was observed between knowledge regarding healthy eating and selected socio-demographic variables, including age, educational status, occupation, dietary pattern, duration of diabetes, family history of diabetes, and history of diabetes-related complications ($P < 0.05$). However, no statistically significant association was found between knowledge level and gender or body mass index ($P > 0.05$). These associations are presented in Table 4.

Since cross-tabulation of the three original knowledge categories (Inadequate, Moderate, Adequate) resulted in expected cell counts below 5 in several cells, violating the assumptions of the chi-square test, knowledge scores were dichotomized into two groups using the median pre-test score (15) as the cutoff; below median (< 15) and at or above median (≥ 15). This regrouping resulted in expected cell counts exceeding 5, ensuring the validity of the chi-square test.

DISCUSSION

The present study demonstrated that nurse-led Diabetes Diet Education was effective in improving knowledge regarding healthy eating among diabetic patients. The baseline findings indicate important gaps in understanding dietary management despite routine exposure to diabetes care. Similar findings were reported among diabetic patients, where inadequate or moderate levels of diabetes-related knowledge were observed. [11] These gaps may be related to limited health literacy, inadequate counselling, misconceptions regarding diabetic diets, and insufficient exposure to structured diabetes education.

The significant improvement in knowledge following the intervention indicates that structured and individualized education can effectively address these knowledge deficits. These findings are consistent with previous evidence showing that diabetes self-management education improves lifestyle practices and self-care. [12] The improvement may be attributed to individualized counselling, structured content, use of audio-visual aids, clarification of doubts, and reinforcement of important dietary concepts.

The predominance of older adults in the present study highlights the need for educational approaches appropriate to the learning needs of older patients. Similar findings were reported, where age was significantly associated with diabetes-related knowledge. [11] Older adults may require repeated counselling, simplified explanations, and visual educational materials to improve comprehension and retention.

Educational status was significantly associated with knowledge in the present study. These findings are consistent with previous research from South India, where educational attainment was associated with diabetes-related knowledge. [13] Higher educational attainment may facilitate comprehension of health information and enable patients to interpret dietary recommendations more effectively.

Occupation was also significantly associated with knowledge. Similar findings were reported in a tertiary-care hospital study, where occupation was associated with diabetes-related knowledge. [11] Differences in educational background, socioeconomic circumstances, access to health information, and healthcare utilization may partly explain this association. The significant association between duration of diabetes and knowledge may be explained by greater exposure to follow-up care, repeated counselling, and practical experience in disease management among patients living with diabetes for longer periods. These findings are consistent with previous evidence showing an association between duration of diabetes and diabetes-related knowledge. [14]

Family history was significantly associated with knowledge, which may reflect greater exposure to diabetes-related information within affected families. Similar findings were reported regarding the relationship between diabetes-related knowledge and patient characteristics. [15] Patients with a family history may have greater opportunities to learn about dietary management and disease prevention through family experiences.

Knowledge was also significantly associated with a history of diabetes-related complications. Patients with complications may have greater contact with healthcare professionals and receive additional counselling regarding disease management. Similar findings were reported among patients attending diabetes clinics, where diabetes education was identified as important for improving knowledge of complications. [16]

In contrast to the significant associations observed with several socio-demographic variables, gender and BMI were not significantly associated with knowledge in the present study. Similar findings regarding the absence of a significant association between gender and diabetes-related knowledge were reported previously. [15] This suggests that educational needs should be assessed individually rather than based solely on gender or anthropometric status.

The findings of the present study highlight the importance of regular nurse-led dietary counselling, structured health education, community awareness programmes, family involvement, and follow-up counselling to improve dietary awareness among diabetic patients. The use of educational materials such as pamphlets and audiovisual aids, along with culturally appropriate dietary guidance, may further enhance patients' understanding and adherence to healthy eating practices. Early identification of knowledge deficits and continuous motivation from healthcare professionals may also promote sustainable lifestyle modifications and effective diabetes self-management.

The present study has several strengths. The quasi-experimental pre-test–post-test design enabled objective evaluation of the effectiveness of the nurse-led Diabetes Diet Education programme. The structured, standardized intervention, validated questionnaire, and appropriate statistical analyses enhanced the reliability of the findings. The study also provides context-specific evidence on nurse-led dietary education among diabetic patients in a tertiary care hospital in Bengaluru.

Nurse-led Diabetes Diet Education can improve dietary knowledge, promote better glycaemic control, enhance self-care behaviours, treatment adherence, and quality of life, and help prevent diabetes-related complications. The intervention also strengthens the role of nurses as educators and health promoters, supporting effective long-term diabetes self-management.

Despite these strengths, studying has certain limitations. The use of a one-group pre-test–post-test design without a control group limits the ability to attribute the observed improvement solely to the intervention. The study was conducted in a single tertiary care teaching hospital using a non-probability convenience sampling technique, which may limit the generalizability of the findings. In addition, the study assessed only knowledge regarding healthy eating and did not evaluate long-term dietary practices, glycaemic outcomes, or sustainability of behavioural changes following the educational intervention.

Future research should include randomized controlled trials or multicentre studies with larger and more diverse samples to strengthen the evidence on the effectiveness of nurse-led diabetes diet education. Long-term follow-up studies are recommended to assess the sustainability of knowledge retention, behavioural changes, dietary adherence, and glycaemic control. Further research may also evaluate the effectiveness of technology-assisted educational interventions, family-centred approaches, and culturally tailored diabetes diet education programmes in improving diabetes self-management and clinical outcomes.

CONCLUSION

The present study demonstrated that nurse-led Diabetes Diet Education was effective in significantly improving knowledge regarding healthy eating among diabetic patients. Knowledge levels were also significantly associated with selected socio-demographic variables, including age, educational status, occupation, dietary pattern, duration of diabetes, family history, and history of diabetes-related complications. These findings emphasize the importance of integrating structured nurse-led dietary education into routine clinical practice to enhance patients' dietary knowledge and support effective diabetes self-management. The study provides evidence that may assist nurses, nurse educators, administrators, and policymakers in developing evidence-based educational strategies to improve diabetes care.

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