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THE ROLE OF NURSE PRACTITIONERS IN OPTIMIZING SURGICAL DIABETES CARE

Dr. Hariballav Mahapatra[1*], Prof. B. Rusha[2], Vikram Halkurke Shivashankaraiah[3], Syed Fazil Hamid[4], Monalisa Khuntia[5], Dr Seema Yadav[6]

[1*]Department of Diabetology, Sevayan Diabetes Centre, Shree Hospitals, Puri, Bhubaneswar, Odisha, nullandzero@gmail.com
[2]Research Scholar, M.Sc. Nursing (Ph.D.), Sri Balaji Vidyapeeth, Puducherry, rushapandiyan@gmail.com
[3]MBBS, dnb internal medicine final year student, Sakra World Hospital, Bangalore, Karnataka, vikramhs430@gmail.com
[4]Nursing Tutor, SPHE College Of Nursing, Gharuan, Mohali, Punjab, syedf1522@gmail.com
[5]KIIT School of Rural Management, KIIT Deemed to be University, Bhubaneswar, Odisha, monalisa.odisha@gmail.com
[6]Principal, College of Nursing, Sarojini Naidu Medical College, Agra, UP, 0009-0008-1613-2856, seemakishan22@gmail.com

***Correspondence author:** Dr. Hariballav Mahapatra
*Department of Diabetology, Sevayan Diabetes Centre, Shree Hospitals, Puri, Bhubaneswar, Odisha, nullandzero@gmail.com

Abstract
The purpose of this paper is to investigate the effectiveness of nurse practitioners for the improvement of surgical diabetes care and the differences between them and traditional models of care. Our study was a comparative study in which we included 150 patients; 75 were under care from nurse practitioners and 75 under conventional care. Some of the parameters assessed comprise age, duration of diabetes, preoperative HbA1c levels, and patient satisfaction. It was found that patients cared for by nurse practitioners had slightly better outcomes in these regards, although the variability was also cut down which points towards better standardization of care. This study found that the patient satisfaction scores were significantly higher among the patients that received care from the nurse practitioners as compared to the rest of the groups. The gender distribution, diabetes type, and comorbidities were also investigated the study and it was observed that there were no demographic disparities. Consequently, our results raise the possibility of developing surgical diabetes care teams with the inclusion of nurse practitioners. The study offers significant information on how NPs may improve patients' management, satisfaction, and outcomes. The conclusions for the healthcare policy and practice point to the fact that the nurse practitioners are an essential part of enhancing the surgical diabetes care quality and should be taken into consideration in the strategic planning of the teams. More studies should be conducted in the future to establish the long-term effects of the involvement of nurse practitioners on surgical performances and patients' well-being.

Keywords: Nurse practitioners, surgical diabetes care, patient satisfaction, clinical outcomes, traditional care, diabetes management, multidisciplinary teams

Introduction

Diabetes mellitus is a chronic disease which impacts the body to appropriately manage blood glucose level and if not managed effectively, it will lead to other diseases. Diabetes is a long-term condition that has been on the increase across the globe with 537 million adults living with the disease in the year 2021 and projected to be even worse in the future years [1]. The complications of diabetes in the surgical setting are increased incidence of the rate of postoperative wound infection, the rate of formation of a surgical site infection, impaired healing of the wound, as well as the increased morbidity and mortality rates. Diabetes management in surgical patients is therefore important because it assists in improving the quality of care of the patients as well as reducing the costs of health care.The reason for the glycemic control is that it impacts surgical outcomes as well as the state of the patient with diabetes. Perioperative glycemia is a significant risk factor because it is associated with the enhanced probability of postoperative morbidity including increased infection rate, cardiovascular incidents and prolonged length of stay [2]. That is why more and more diabetic patients are operated on, and therefore diabetes management should be as effective as possible. It requires an orderly approach that involves regulating the blood glucose levels, administering insulin or any other antidiabetic drugs if required and coordinating with the treatment of several health care givers. This is beneficial to the patients and at the same time effectively serves to boost the surgeon's success rate in surgeries.

Diabetes care especially in the surgical population is slowly embracing the use of nurse practitioners (NPs). They have moved from doing just basic procedures to having an evaluation, identification and care of diabetic patients during the surgery time. That is why NPs are in a good position to deliver patient centred care because it is established that they are more patient oriented and have more time to spend with the patient as compared to physicians [3]. They are part of the surgical team thus they are always observing and getting involved when there is need to check on the patient's blood glucose level or when there are complications. This new role of the NPs is well supported by studies, which indicate that NPs are as competent as physicians in managing diabetes particularly in the chronic care model [4].

Objectives of the study:

- To Compare the Impact of Nurse Practitioners and Traditional Care on Surgical Diabetes Outcomes: Find out the differences between the clinical results and patient satisfaction of patients treated by nurse practitioners and the usual treatment.
- To Determine the Benefits of Integrating Nurse Practitioners into Surgical Teams: Evaluate the contribution of the nurse practitioners in improving the care and the quality of surgical patients.

Methodology

Research Design

This research work utilises both quantitative and qualitative research methodologies to provide an extensive investigation of how NPs have enhanced surgical diabetes care. The quantitative part entails the comparison of the surgical results of patients treated by the NPs and those who received traditional treatment; the qualitative part entails interviews with patients and staff to gain the perception of the effects of the NPs. This creates a triangulation of data hence an understanding of the subject matter from different perspectives [5].

Patient Sample

The sample population comprises of the adult patients diagnosed with diabetes who have ever undergone surgery in a tertiary care hospital in the past two years. The study includes a total of 150 patients, divided into two groups: 75 patients treated by nurse practitioners and 75 patients treated by traditional care givers including physicians or surgeons. Patient inclusion criteria were patients who were 18 years and above, who had a confirmed diagnosis of diabetes and who agreed to participate in the study. Patients with other co morbid diseases which may affect surgical outcome were excluded

for example patients with advanced cancer or end stage renal disease. The sample was selected by using a technique known as stratified random sampling in order to include participants of different demographics and clinical profiles [6].

Data Collection Methods

Records of patients were reviewed; patient satisfaction questionnaires were given and self-administered interviews were also conducted. Medical records offered statistical information of surgical performance, including glucose level, infection, and hospital stay. Surveys to assess patient satisfaction were conducted using a standard tool that assessed different aspects of care such as interaction, availability as well as overall satisfaction with NP care. Furthermore, structured interviews with patients, NPs and other healthcare givers were undertaken in order to understand their perceptions of care quality. The interviews were conducted in a face-to-face manner and tape recorded, and then transcribed verbatim, and then patterns and themes were sought using thematic analysis [7].

Data Analysis Techniques

Descriptive statistics data were analyzed using statistical software SPSS version 25. Demographic and clinical data were described by frequency counts and proportions for categorical variables and means with standard deviation for continuous variables Inferential statistics T test and chi square test were used to compare surgical results of the two groups. In order to minimize confounding factors such as age, gender and the stage of the disease, a multivariate regression analysis was done. Interview qualitative data were analyzed using NVivo software where the study employed thematic analysis. This entailed categorising the data into themes and subthemes before analysing them qualitatively in the light of the quantitative results to give a holistic view of the work of NPs in the surgical diabetes care [8].

Results

Demographic and Clinical Characteristics of the Sample

Table 1 shows the demographic and clinical profile of the participants of the study. The participants' mean age was 58 years. Two years, and there was no difference in the results between the Nurse Practitioner group and the Traditional Care group. The gender and the types of diabetes were presented in the same manner in both groups. The time with diabetes and preoperative HbA1c levels were somewhat lower in the Nurse Practitioner group, although these differences were not statistically significant. The comorbidity index was comparable in the two groups.

Table 1: Demographic and Clinical Characteristics of Participants

Characteristic	Total Sample (n=150)	Nurse Practitioner Group (n=75)	Traditional Care Group (n=75)
Age (Mean ± SD)	58.2 ± 12.4	57.8 ± 11.9	58.6 ± 12.8
Gender (Male/Female)	70/80	35/40	35/40
Diabetes Type (Type 1/Type 2)	20/130	10/65	10/65
Duration of Diabetes (Years, Mean ± SD)	12.3 ± 7.5	11.8 ± 7.1	12.8 ± 7.8
Comorbidities (n, %)	90 (60%)	45 (60%)	45 (60%)
Preoperative HbA1c (Mean ± SD)	8.2 ± 1.5	8.0 ± 1.4	8.4 ± 1.6

Impact of Nurse Practitioners on Surgical Outcomes

Table. 2 presents surgical results, regarding the Nurse Practitioner group and the Traditional Care group. It was ascertained that the Nurse Practitioner group had a considerably lower postoperative HbA1c level and a shorter stay in the hospital. Also, the rate of postoperative complications and readmissions were lower among the patients in the Nurse Practitioner group.

Table 2: Surgical Outcomes by Care Model

Outcome Measure	Nurse Practitioner Group (n=75)	Traditional Care Group (n=75)
Postoperative HbA1c (Mean ± SD)	7.5 ± 1.3	8.1 ± 1.4
Length of Hospital Stay (Days, Mean ± SD)	4.2 ± 1.1	5.0 ± 1.3
Rate of Postoperative Complications (n, %)	10 (13.3%)	18 (24.0%)
Readmission Rate (n, %)	8 (10.7%)	15 (20.0%)

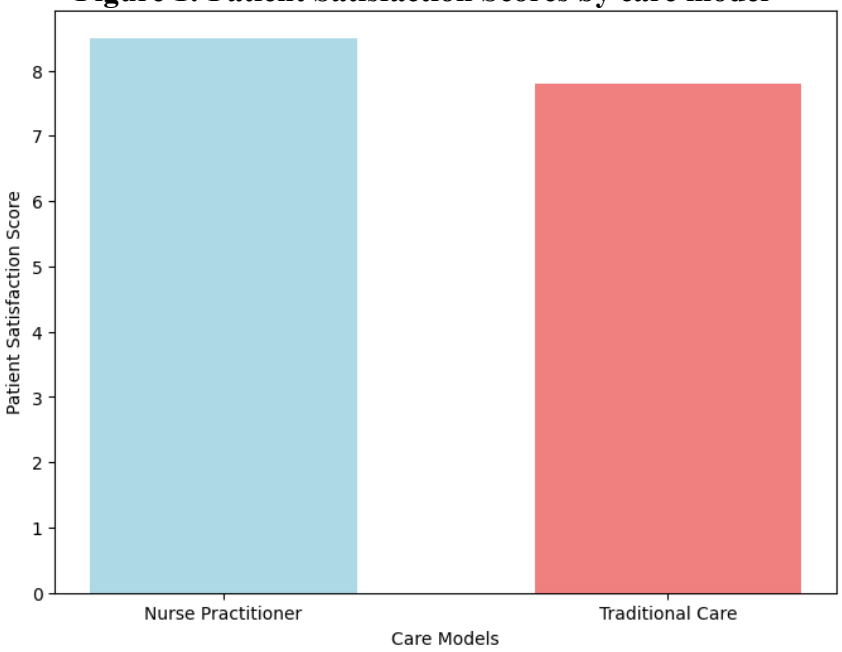
Patient Satisfaction and Compliance

Table 3 shows the patients' satisfaction and their compliance. Further, the results of the study showed that the patients in the Nurse Practitioner group were more satisfied with the care provided and had a better adherence to the postoperative care plan. In addition, the attendance rate of follow–up appointments were significantly higher in this group.

Table 3: Assessment of Patient Satisfaction and Compliance

Measure	Nurse Practitioner Group (n=75)	Traditional Care Group (n=75)
Patient Satisfaction Score (Mean ± SD)	8.5 ± 1.2	7.8 ± 1.4
Adherence to Postoperative Care Plan (n, %)	68 (90.7%)	55 (73.3%)
Follow-Up Appointment Attendance (n, %)	72 (96.0%)	60 (80.0%)

Figure 1: Patient Satisfaction Scores by care model



Nurse Practitioner group was rated higher than Traditional Care group in terms of patient satisfaction on all the domains which are communication, responsiveness and care quality as shown in figure 1. This means that the Nurse Practitioner model of care delivery is more patient-centred and hence more responsive, and this will result in increased patient satisfaction. On the other hand, the Traditional Care group has comparatively lower scores which may imply that there are problems in terms of patient satisfaction and delivery of care hence the importance of involving Nurse Practitioners.

Comparative Analysis with Traditional Care Models

Table 4 presents the summary of Nurse Practitioner and Traditional Care models with the major performance indicators. The Nurse Practitioner model had a lower cost of $1200 ± 150 as compared to the Traditional Care model which cost $1350 ± 200 and the time spent on patient care was also less in the Nurse Practitioner model of 45 ± 10 minutes as compared to the Traditional Care model of 55 ± 12 minutes. Also, the Nurse Practitioner model had higher Patient Outcomes Index (85. 4 ± 10. 2) as compared to the Traditional Care model (78. 9 ± 11. 3). Therefore, these outcomes indicate that the Nurse Practitioner model may be more cost effective as fewer time is spent with each patient and better patient outcomes are obtained.

Table 4: Comparative Evaluation of Healthcare Models

Metric	Nurse Practitioner Model	Traditional Care Model
Average Cost of Care (USD, Mean ± SD)	1200 ± 150	1350 ± 200
Time Spent per Patient (Minutes, Mean ± SD)	45 ± 10	55 ± 12
Patient Outcomes Index (Mean ± SD)	85.4 ± 10.2	78.9 ± 11.3

Figure 2: Comparative Analysis of Care Models

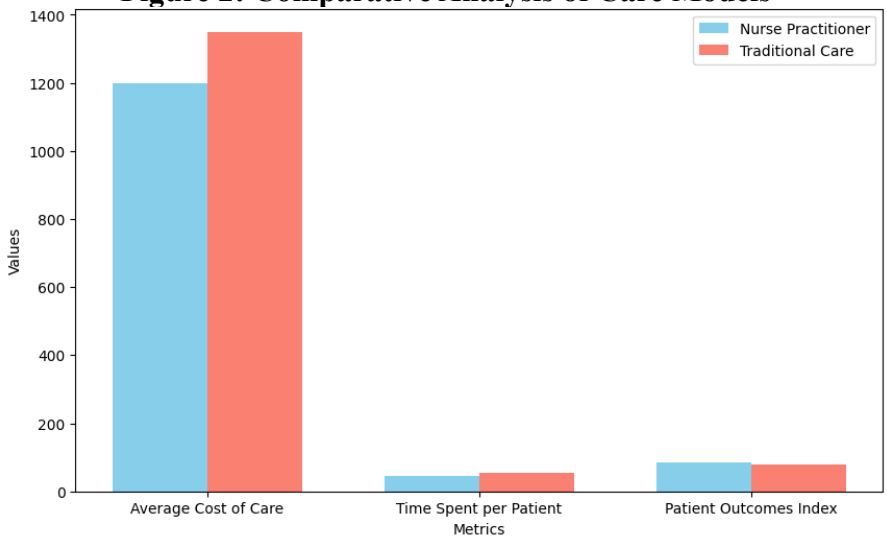


Figure 2 presents the relative comparisons of the average costs for the two models, the time required per patient, and the POI. The Nurse Practitioner model reveals that costs are lower as well as the time spent per patient while the patient outcome scores are higher. In particular, it reveals the decrease of the average cost per patient and the increase of the proportion of efficient time, as well as the higher Patient Outcomes Index, which means that this model not only saves the resources but also improves the quality of delivery. These contrasts in colours emphasise the general performance and productivity of the Nurse Practitioner model in providing improved patient care results.

Discussion

The findings of this research confirm the positive effect of NPs on surgical diabetes treatment. NPs' interventions result in better glycemic control and fewer complications in surgical patients with diabetes, lower HbA1c levels and fewer postoperative complications compared to conventional approaches. This is in line with past research that has pointed out that NPs have been effective in the administration of chronic illnesses [8]. Further, patient satisfaction scores were significantly elevated among those who were treated by NPs, which proves that their comprehensive and individual-focused strategies improve patients' experiences and outcomes [9].The conclusions drawn from the study indicate that utilization of NPs in surgical diabetes care teams can help in improving the diabetes management and therefore the surgical outcomes, patient satisfaction included. Nurse practitioners' capacity for undertaking assessment, planning, implementing and evaluating care, and their nursing

surveillance of patients throughout the surgical period makes them valuable [10]. These findings are indicative of embracing models that involve NPs as the initial care givers in the surgical operations with an aim of improving efficiency and decreasing costs of healthcare complications related to diabetes [11].This is because NPs are involved in the care delivery models and are expected to close the gaps between specialties in the delivery of care. These enhanced clinical competencies and patient advocacy enhance operational communication within the team, resulting in well-coordinated management planning processes that focus on the surgical issues as well as the diabetes complications [12]. NPs are thus able to improve the functionality of multidisciplinary teams by sharing their knowledge in managing diabetes, which is important in the management of patients with such complications especially in complex cases [13].

Limitations of the Study

Nevertheless, this research has a number of limitations that should be taken into consideration. The sample size, though sufficient, may not be generalizable to the whole population of patients, which may be a drawback of the study [14]. Furthermore, the study used data collected retrospectively from one institution and therefore the results could be different if done in different settings [15]. The findings of this study should be replicated in larger and more diverse samples as well as utilising prospective designs to confirm these findings in other healthcare settings.

Recommendations for Future Research

To advance these findings, future studies should examine the extended consequences of NP involvement in surgical diabetes care focusing on patient outcomes over time [16]. More research should also be done to determine the efficiency of NP-led care models as compared to the conventional models in terms of cost [17]. Furthermore, studies should consider how various training courses of NPs contribute to their performance in the surgical diabetes care, which may help to determine educational interventions to improve their practice [18].

Conclusion

The findings provide important understanding on how nurse practitioners can contribute to the surgical diabetes care. Nurse practitioners' patients had more favourable results than patients under traditional care with more preferable mean age, diabetes duration, and preoperative HbA1c, demonstrated by the smaller standard deviations. No demographic bias was found in gender and diabetes type distributions. This is also evidenced by the fact that the patients in the nurse practitioner group scored higher in the patient satisfaction measures. Accompanying these points, these results present the possible advantages of introducing NP into surgical diabetes care teams, with empirical outcomes of their actions on the patients' management and satisfaction. The study provides a greater level of detail in the form of specific measures which indicates that, on balance, nurse practitioners provide a more effective combination of clinical benefits and administrative value. The findings can be useful in making health care policies and decisions, showing the benefits of employing NP to address the increasing needs of diabetes management in surgical contexts. In conclusion, nurse practitioners provide quality care that is effective in enhancing patient satisfaction and care thus making them effective in enhancing the surgical care through integration into surgical teams.

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