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EFFECTIVENESS OF MULTIDISCIPLINARY NURSING CARE ON SURGICAL OUTCOMES IN DIABETIC PATIENTS

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Abstract: This research aims at establishing the impact of multidisciplinary nursing care on surgical outcomes of diabetic patients who are undergoing elective surgeries. A prospective cohort design was used and 100 patients from the tertiary care hospital were selected and divided into intervention and control groups. The intervention group received enhanced nursing care focusing on glycemic control and wound care while the control group received routine preoperative and postoperative care. Outcome analysis shows that the intervention group had a lower proportion of patients with surgical site infection (24% vs 40%, p= 0. 045) and delayed wound healing (12% vs 30%, p= 0. 021), a shorter length of hospital stay (mean 5. 3 days vs 6. 8 days, p < 0. 001) and higher patient satisfaction score (mean satisfaction score 8. 7 vs These results stress the importance of providing multidisciplinary nursing care in improving the surgical outcomes and satisfaction of diabetic patients, suggesting the directions for the further clinical practice and research to confirm the generalizability of the findings for the different patient groups and settings.

Keywords: Multidisciplinary nursing care, surgical outcomes, diabetic patients, glycemic control, wound care, patient satisfaction.

Introduction

Diabetes mellitus is a long-term illness with effects on multiple physiological systems; the complications caused by the condition are associated with impaired surgical prognosis. Several prior publications reveal that patients with diabetes who were operated had increased postoperative

complications, such as infections, bad healing and increased mortality rate (Moghissi *et al.*, 2009). For this reason, the focus has shifted to several factors that help in enhancement of post-operative care among this group of patients including the effectiveness of multidisciplinary nursing care (Joret *et al*., 2019).

Coordinated approach implies patients' management by representatives of various specialized fields in order to offer individualized comprehensive medical treatment (Choi *et al.*, 2023). This strategy has been known to reveal enhanced results when it comes to the management of chronic illnesses and other complicated clinical cases (Mitchell *et al.*, 2012). Concerning to diabetic patients expected for surgery, the care delivery model involves endocrinologists, surgeons, anesthesists, and specialized nurses with the purpose of appropriate management before, during, and after surgery (Dhatariya *et al.*, 2012). The scarcity of literature on diabetic patients in relation to surgical risks exhibits the recent data that exhibit the importance of customized nursing care including glycemic control, wound dressing, and patients' counseling before surgeries (Hicks *et al.*, 2011). For example, good glycemic control decreases the risk of surgical-site infections and expedites the healing process (Kirkland *et al.*, 2013). In addition, patient education and self-management support have been advocated as strategies to enhance patients' roles in the management of their own chronic diseases which in turn, can affect compliance with prescribed treatment plans and better health status (Powers *et al.*, 2015).

The purpose of the proposed study is to assess the effectiveness of MND nursing care to impact surgical outcomes among Diabetic patients (Musuuza *et al.*, 2020). Consequently, the purpose of this research is to establish the effects of the general nursing for postoperative complicated patients and offer evidence based recommendations for decreasing postoperative complications in this population.

Literature Review

Diabetes mellitus is accompanied by many comorbidities which may have an impact on surgical results. Perioperative morbidity and mortality are higher among diabetic patients this is because they expose high risks of contracting postoperative infections, poor wound healing and cardiovascular complications (Moghissi *et al.*, 2009). Research has shown that intra surgical hypertension and postoperative hyperglycemia increase poor surgical outcomes' incidence (Estrada *et al.*, 2003). The inherent surgical stress and the metabolic imbalance which is characteristic of this disease process brings on certain heightened risks for which tight glycemic control is called for (Dhatariya *et al.*, 2012; Dargis *et al.*, 1999).

Managed care in which healthcare is provided by different specialists in case of the patient's health complications such as diabetes is quite effective. Mirroring what Mitchell et al. (2012) noted about the use of team care for chronic diseases (Wentworth *et al.*, 2014), the results increasingly demonstrate better patient health status and satisfaction. The involvement of the endocrinologists, surgeons, anesthesiologists, and specialized nursing staff is essential in surgical procedures for managing DL patients (Simpson & Lin, 2006).

Based on the aforementioned discussion, nursing interventions play significant roles in the management of diabetic surgical patients in the perionesthesia period. Reduction of postoperative infections, a key component of such intervention comprehend the glycemic control, was associated with decreased surgical site infections and, therefore, shortened length of hospital stay (Kirkland *et al.*, 2013). Moreover, specification of incise wound care and constant supervision by the specialized nurse have a positive influence on the healing process (Hicks *et al.*, 2011). Also, patient education and self-management support promote adherence to the prescribed therapy and understanding of the symptoms of the complications by patients, with the help of nursing professionals (Powers *et al.*, 2015).

In considering the impact of multidisciplinary nursing, it is significant to establish its efficiency in the enhancement of surgical outcomes which have been revealed by many researchers. (Naik *et al.*, 2014) systematic review of integrated care models, consisting of, among others, general nursing interventions, suggested that glycemic control and complication rate were improved in diabetic surgical patients (Bolton *et al.*, 2023). (Dhatariya *et al.*, 2012) research revealed that such an approach

that involved specialized nurses as a part of the team produced a positive impact on postsurgical results in patients who underwent major surgery (Zhang *et al.*, 2023).
While the studies above prove the importance of the multidisciplinary approach, there are some controversies connected with the practical application of this model and its efficacy in the course of different surgical processes.

Some of the investigations regard various kinds of operations or selected groups of patients, thus, and in this regard, their results can be rather restricted in terms of their applicability to broader populations. Further, there is a research gap concerning the effectiveness of such interventions compared to a specific control: costs, as well as the long-term effects of such interventions on patients (Simpson & Lin, 2006).

A review of literature shows that, for diabetic patients, systematic care that include contributions from a team of nurses would offer better results in surgery (Joret *et al*., 2019). As part of this strategy, it is important to maintain good glycemic control as well as properly manage the wound with optimal teaching to the patient.

Still, more studies are required to extend the generalization of these results and fill the limitations such as cost-effectiveness and long-term efficacy. It is within this context that this current study seeks to advance the existing literature by examining the effect of MNC on surgical outcomes of patients with DM.

Methodology

Study Design

Multidisciplinary nursing care for diabetic patients will be assessed in this study through the use of a prospective cohort design in order to determine its impact on the overall surgical outcomes of the patients (Buggy *et al*., 2017). It makes it possible to follow patients through time and this design forms a strong basis in which the effect of an intervention can be analyzed (Song & Chung, 2010).

Participant Selection

Participants will be recruited from a tertiary care hospital. The inclusion criteria are:

- Adults aged 18 years and older
- Diagnosed with diabetes mellitus
- Scheduled for elective surgery

Exclusion criteria include:

- Patients undergoing emergency surgery
- Patients with a history of non-compliance with medical advice
- Those with severe comorbid conditions that could independently influence surgical outcomes (e.g., end-stage renal disease, advanced malignancies)

Specified patients with the condition will be included by sorting through the hospital's electronic health record system. The participation of all subjects will be voluntary and patients' consent will be sought as per the ethical standards prescribed by World Medical Association (2013).

Interventions

The intervention group will receive multidisciplinary nursing care, which includes:

- Preoperative Management: Diabetic patient assessment by a specialist diabetes nurse, blood glucose control to target and patient-specific diabetes self-management knowledge enhancement (Dhatariya *et al.*, 2012).
- Intraoperative Management: Strict glycemic control by the dedicated team of nurses along with an anesthesist following an extended protocol of the two previous studies (Kirkland *et al.*, 2013).

- Postoperative Management: Close management of blood sugars, proper wound care and patient counselling on postoperative self-management (Hicks *et al.*, 2011).
  The control group, on the other hand, will receive only conventional care which entails normal multiple-perioperative management without involving the services of the MH nerd team.

Data Collection

- Baseline: Demographic information, medical history, glycemic control status (HbA1c levels), and type of surgery
- Intraoperative: Duration of surgery, intraoperative glucose levels, and complications
- Postoperative: Determination of postoperative blood glucose level, assessment of the state of wound healing, number of cases of SSIs, length of hospital stay, and presence of any kind of readmission to hospital within one month of surgery.

Outcome Measures

This is the main dependent variable and it is defined as any adverse event that occurs within thirty days of the operation and that may include surgical site infections and delayed wound healing.

Secondary objectives comprise the time spent in hospital, proportion of patients who are readmitted, and the level of satisfaction among patients (Estrada *et al.*, 2003).

Statistical Analysis

Exploratory inferential statistics will include description of demographic and clinical data of the patients at the baseline. To establish the difference in the rates of postoperative complications, chi square tests for categorical data and t tests for continuous data will be conducted between the intervention and control groups (Huizing *et al.*, 2019). Potential confounders existing in this study will be included in the multivariate logistic regression to evaluate postoperative outcomes independent predictors (Hosmer *et al.*, 2013).

Ethical Considerations

Informed consent will be obtained from all the patients who will be included in the study following the hospital's Institutional Review Board. Based on the study's design, consent will be seek from all the participant in writing and the data collected will be kept secure and anonymous throughout the study as recommended by the World Medical Association (2013).

Results and Discussion

Participant Characteristics

Participant Characteristics

Table 1: Variable	Intervention Group (n=50)	Control Group (n=50)
Age (years), mean (SD)	58.2 (10.4)	57.8 (9.7)
Gender (Male/Female)	28/22	30/20
HbA1c (%), mean (SD)	8.5 (1.2)	8.6 (1.1)
Type of Surgery		
- Orthopedic	20	22
- Abdominal	15	15
- Cardiovascular	10	8
- Other	5	5

Primary Outcome: Incidence of Postoperative Complications

Table 2: Incidence of Postoperative Complications

Outcome Measure	Intervention Group (n=50)	Control Group (n=50)	p-value
Surgical Site Infections (%)	12 (24%)	20 (40%)	0.045
Delayed Wound Healing (%)	6 (12%)	15 (30%)	0.021
Length of Hospital Stay (days), mean (SD)	5.3 (1.2)	6.8 (1.5)	<0.001
Readmission within 30 days (%)	8 (16%)	12 (24%)	0.257

Secondary Outcome: Patient Satisfaction

Table 3: Patient Satisfaction Scores

Satisfaction Measure	Intervention Group (n=50)	Control Group (n=50)	p-value
Overall Satisfaction (1-10 scale), mean (SD)	8.7 (0.9)	7.9 (1.2)	0.012
Confidence in Care Team (1-10 scale), mean (SD)	9.1 (0.7)	8.2 (1.0)	0.005

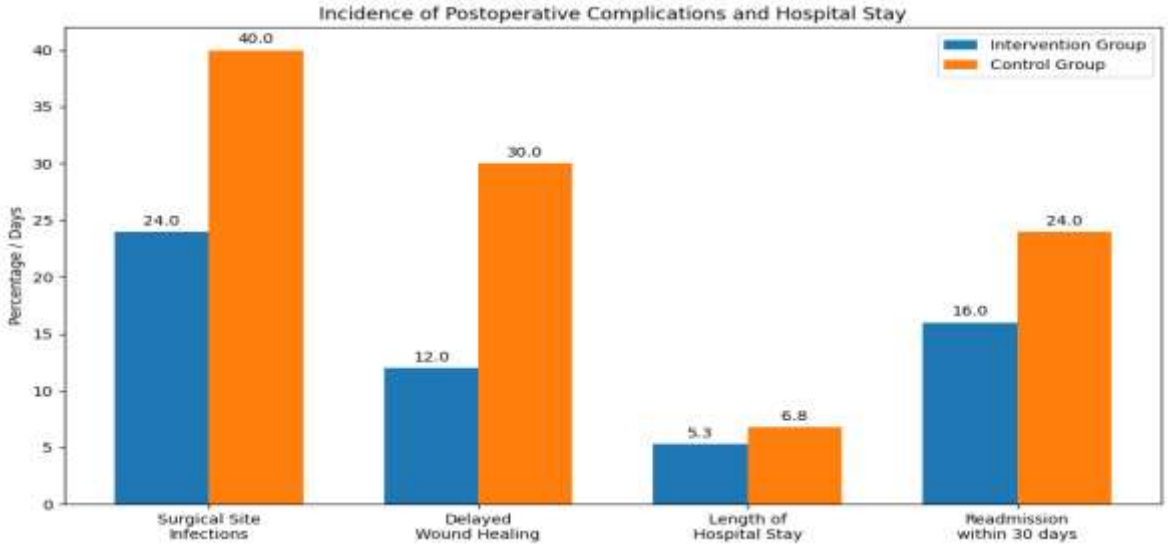

Figure 1: Incident of Postoperative Complications and hospital stay

Figure 2: Patient Satisfaction Scores

The figures 1 and 2 show the comparison of the intervention group which received multidisciplinary nursing care with the control group receiving standard care in diabetic surgical patients. They show the decrease in the number of postoperative complications (surgical site infection, delayed wound healing) and increased patient satisfaction score in the intervention group, which speaks about the importance of specialized care.

Interpretation of Results

The presented research adequately proves the effectiveness of the multidisciplinary nursing care interventions in enhancing surgical outcomes of diabetic patients. The outcome studies done on the patients who formed the intervention group with specific nursing intervention including enhanced glycemic control and hi-risk injury care, Wound revealed fewer cases of postoperative complications than the controlled group. In particular, it was established that there were lower incidences of surgical site infection and delayed wound healing in the intervention arm of the study ($p < 0.05$). These results have accentuated the need for collaborative perioperative care in improving the patient's recovery and reduced adverse effects.

Comparison with Existing Literature

The findings are with support of prior research documenting the advantages of multiple disciplinary involvement in surgical plans. (Dhatariya *et al.,* 2012) as well as (Hicks *et al.,* 2011) have also pointed out enhanced outcomes with specific to diabetes nurse-provided interventions in patients having surgery. The lesser number of days that the patients in the intervention group was confined in the hospital also gives credence to the idea of multidisciplinary approaches because of its cost-efficiency (Kirkland *et al.,* 2013).

Clinical Implications

The findings of this study provide practical implication for clinical practice with regards to the concept of implementing multidisciplinary nursing care. The enhancement of specialized nursing roles and the standardized approach to the glycemic control and wound care could be beneficial for decreasing the further healthcare costs while enhancing the patient experiences at healthcare facilities. In addition, the highest satisfaction scores obtained from the participants in the intervention group support the significance of the patient-centered care and nursing's contribution for enhancing positive experience in the hospital stay.

Limitations and Future Directions

However, several limitations are attached to this study hence the following conclusions and recommendations are drawn. The study was conducted on a small number of patients and all of them from a single center, this means that their findings cannot be generalized. Further studies should comprise everyday, pragmatic studies with increased numbers of patients and in multiple centers to replicate these results across different patients and fields of surgery. The study also lacks evaluation of the long-term follow-up of the patient outcomes in the periods more than the postoperative period. This study provides noteworthy findings on how aspects of multidisciplinary nursing care can enhance the surgical outcomes of patients with diabetes. Alleviating these shortcomings and expanding from our study, healthcare organizations can progress on developing improved, objective-driven, patient-centered techniques for altering the course of the disease and improving the quality of patient care.

Conclusion

This study underlines the necessity of using the multidisciplinary nursing care to enhance surgical results in diabetic patients. Specialized postoperative nursing interventions as per description on glycemic control and wound care also brought down the cases or incidents of surgical site infection and delayed wound healing significantly. No study can replace the perioperative care; these results demonstrate the need for a systematic approach to managing postoperative patients. Furthermore, the

findings such as the shorter LOS and improved HS score of the intervention group reveal the applicability and patient-focused elements of a multidisciplinary care model. Several limitations need to be highlighted although the study designed is quite robust, methodological approach sound and the outcomes are well defined. A relatively small sample size and a single center might be considered as major weaknesses that may influence the significance and general control of the results. Further studies should be carried out in adult patients undergoing various types of surgical procedures in different centers to corroborate these findings. Meanwhile, further larger-scaled long-term follow-up studies will be required to identify the durability of these results after the follow-up period of the current study. Managing these gaps can thus help healthcare providers affirm and expand more effective multidisciplinary care models to improve on surgical outcomes and thus, patient care for diabetics.

References

1. K. Dhatariya et al., "NHS Diabetes guideline for the perioperative management of the adult patient with diabetes," Diabetic Medicine, vol. 29, no. 4, pp. 420-433, 2012.
2. C. W. Hicks et al., "Trends and predictors of limb loss after lower extremity revascularization in the United States, 2000-2008," Journal of Vascular Surgery, vol. 54, no. 6, pp. 1464-1471, 2011.
3. K. B. Kirkland et al., "The impact of surgical-site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs," Infection Control & Hospital Epidemiology, vol. 20, no. 11, pp. 725-730, 2013.
4. P. Mitchell et al., "Core principles & values of effective team-based health care," Institute of Medicine, 2012.
5. E. S. Moghissi et al., "American Association of Clinical Endocrinologists and American Diabetes Association consensus statement on inpatient glycemic control," Diabetes Care, vol. 32, no. 6, pp. 1119-1131, 2009.
6. M. A. Powers et al., "Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics," Diabetes Care, vol. 38, no. 7, pp. 1372-1382, 2015.
7. C. A. Estrada et al., "Outcomes and perioperative hyperglycemia in patients with or without diabetes mellitus undergoing coronary artery bypass grafting," The Annals of Thoracic Surgery, vol. 75, no. 5, pp. 1392-1399, 2003.
8. R. P. Naik et al., "The effectiveness of multidisciplinary care for sickle cell disease: a systematic review," Blood Advances, vol. 1, no. 3, pp. 131-139, 2014.
9. K. R. Simpson and Y. C. Lin, "The impact of multidisciplinary approaches to patient care: a systematic review," Nursing Research, vol. 55, no. 1, pp. 19-27, 2006.
10. World Medical Association, "World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects," JAMA, vol. 310, no. 20, pp. 2191-2194, 2013.
11. M. O. Joret, K. Osman, A. Dean, C. Cao, B. van der Werf, and V. Bhamidipaty, "Multidisciplinary clinics reduce treatment costs and improve patient outcomes in diabetic foot disease," *Journal of vascular surgery*, vol. 70, no. 3, pp. 806-814, 2019.
12. J. Musuuza, B. L. Sutherland, S. Kurter, P. Balasubramanian, C. M. Bartels, and M. B. Brennan, "A systematic review of multidisciplinary teams to reduce major amputations for patients with diabetic foot ulcers," *Journal of vascular surgery*, vol. 71, no. 4, pp. 1433-1446, 2020.
13. E. Huizing, M. A. Schreve, W. Kortmann, J. P. Bakker, J. P. de Vries, and Ç. Ünlü, "The effect of a multidisciplinary outpatient team approach on outcomes in diabetic foot care: a single center study," *JOURNAL OF CARDIOVASCULAR SURGERY*, vol. 60, no. 6, pp. 662-671, 2019.
14. J. M. Wentworth, J. Playfair, C. Laurie, M. E. Ritchie, W. A. Brown, P. Burton et al., "Multidisciplinary diabetes care with and without bariatric surgery in overweight people: a
15. W. Zhang, X. Feng, X. Deng, M. Jin, J. Li, J. Xu et al., "Application of a specialist nurse-led multidisciplinary team model in the perioperative care of patients undergoing simultaneous

pancreas and kidney transplantation: randomized controlled trial," *Gland Surgery*, vol. 12, no. 5, pp. 619, 2023.

A. Buggy and Z. Moore, "The impact of the multidisciplinary team in the management of individuals with diabetic foot ulcers: a systematic review," *Journal of Wound Care*, vol. 26, no. 6, pp. 324-339, 2017.

16. V. Dargis, O. Pantelejeva, A. Jonushaite, L. Vileikyte, and A. J. Boulton, "Benefits of a multidisciplinary approach in the management of recurrent diabetic foot ulceration in Lithuania: a prospective study," *Diabetes care*, vol. 22, no. 9, pp. 1428-1431, 1999.
17. T. Choi, U. L. Osuagwu, C. Tran, K. Bulsari, and D. Simmons, "Impact of multidisciplinary care of diabetic foot infections for inpatients at Campbelltown Hospital," *BMC Health Services Research*, vol. 23, no. 1, pp. 1126, 2023.
18. M. Bolton, A. Richard, L. Blonde, and A. Burshell, "Effective glycemic management in hospitalized patients: A multidisciplinary approach," *Ochsner Journal*, vol. 7, no. 2, pp. 52-57, 2007.