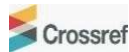




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Effectiveness of Preoperative Nursing Visits in Reducing Preoperative Anxiety Among Surgical Patients in Kaduna State, Nigeria.

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ABSTRACT

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Background: Preoperative anxiety (PA) is a prevalent challenge among surgical patients and is linked to poorer perioperative outcomes. Preoperative nursing visits (PNVs) were significantly associated in reducing PA, but evidence from Nigerian tertiary hospitals particularly in northern states remains limited.

Methods: A post-test only non-equivalent control group quasi-experimental design was used to recruit 204 patients scheduled for elective surgeries in two tertiary hospitals in Kaduna State. Participants were divided into intervention (n = 102) and control (n = 102) groups. Anxiety levels were categorized as mild, moderate, or severe. Chi-square and independent t-tests were used to determine associations between PNVs and preoperative anxiety.

Results: Most respondents were young and in their middle age with relatively high educational attainment. Patients who received the intervention reported considerable low mean in anxiety scores as against those in the control group (Mean = 2.82 as against 3.11; $t = -2.90883$, $p = 0.00981$). Chi-square analysis confirmed a significant association between PNVs and anxiety levels ($\chi^2 = 12.026$, $df = 2$, $p = 0.002$). Patients who received PNVs expressed less worries about anaesthesia and surgery but demonstrated stronger informational needs, particularly regarding anaesthesia and surgical procedures.

Conclusion: Our findings show that patients who received PNVs reported lower anxiety scores compared to those receiving routine nursing care. While the design does not allow causal conclusions, the results suggest that PNVs may play a useful role in reducing patient anxiety in Nigerian tertiary hospitals. Integrating PNVs into routine perioperative practice may strengthen patient-centred care, reduce surgical anxiety, and improve outcomes.

Keywords: Preoperative anxiety; preoperative nursing visit; perioperative nursing; perioperative outcomes; surgical patients.

BACKGROUND

Preoperative anxiety (PA) affects eight in every ten surgical patients (SPs) and is related to high postoperative pain, delay in recovery, prolonged hospitalization, and reduced patient satisfaction with surgical care(1–3). Anxiety is mostly triggered by fear of anaesthesia, uncertainty about surgical outcomes, fear of postoperative pain and surgical complications. Non-pharmacological intervention on educational and psychological support carryout by nurses was associated with lowering PA and enhancing perioperative outcomes(4,5).

Preoperative nursing visits (PNVs) offer SPs individualised information, reassurance, emotional support, and anticipatory guidance. Evidence from a high-income country indicates that PNVs significantly lower anxiety and contribute to better postoperative outcomes, including reduced pain, fewer complications, and improved postoperative recovery and outcomes(6–9). The use of emerging techniques such as enhanced preoperative education and virtual reality based preoperative patients' preparation further demonstrate anxiety-reducing potential(10,11).

In Nigeria, studies from Osun and Borno States report that preoperative counselling and education reduce anxiety and postoperative pain, supporting the relevance of nursing-led interventions in resource-constrained environments(12,13). With limited pharmacological options and high surgical caseloads in many tertiary hospitals, structured PNVs remain a feasible and cost-effective strategy(13).

Despite evidence from Southern Nigeria and high-income countries, there are limited empirical evidence on structured PNVs in Northern Nigeria's tertiary hospitals and challenges of implementing PNVs in Nigerian tertiary hospitals, cultural factors influencing patient anxiety. Thus, this study provides evidence on PNVs in Kaduna State by assessing whether PNVs is associated with reducing PA among SPs in tertiary hospitals.

METHODS

Study Design, Setting and Participants

To evaluate the effect of PNVs, we carried out a posttest only non-equivalent group quasi-experimental study on SPs in two tertiary teaching hospitals in Kaduna State, Nigeria. This design was used due to the impracticality of randomization and within-hospital controls. The two hospitals were selected to prevent treatment contamination and preserve routine nursing care practices, and both institutions are comparable public tertiary referral teaching hospitals within the same state, making the design appropriate and consistent with real world nursing intervention studies. Surgical patients scheduled for elective procedures at Ahmadu Bello University Teaching Hospital (ABUTH) Zaria who received structured PNVs (intervention group), while those at Barau Dikko Teaching Hospital (BDTH), Kaduna, received routine nursing care (control group). Adults undergoing elective surgery between the ages of 18 and 60 were eligible to participate and patients with diabetes, autoimmune disorders, mental illness, cognitive/hearing impairments, emergency surgeries, previous surgeries, day-case procedures, or post-traumatic stress disorder were excluded.

Sample Size Determination and Sampling Technique

The Cochran-Armitage formula for comparing two proportions was used to determine the sample size, with 70% of the intervention group and 50% of the control group predicted to have positive outcomes. At 80% power and 95% confidence. A total of 204 patients in all were calculated and for each group, 102 patients were recruited after accounting for 10% attrition. A convenience sampling was employed, and every participant gave their informed consent.

Intervention: Preoperative Nursing Visit

The PNV consisted of a structured 20–30-minute session conducted at least 24 hours prior to surgery by trained perioperative nurses using a validated checklist. The components included explanations of the surgical procedure,

anaesthesia, expected recovery, pain management strategies, and postoperative care instructions. Perioperative Nurses also provided emotional reassurance and encouraged patients to ask questions. This standardized approach ensured uniform delivery of information and minimized variability in patient experience.

Tools for Data Collection

A semi-structured questionnaire given by the interviewer was used to collate the data and Amsterdam Preoperative Anxiety and Information Scale (APAIS) was adapted for this study by merging the original Likert-scale responses into three clinically meaningful categories: mild, moderate, and severe anxiety. This collapsing was performed to enhance interpretability, facilitate categorical analysis, and align anxiety levels with clinical decision-making. The modification did not alter the original items and the scoring structure of the tool but involved post-scoring categorization and the reliability of the modified tool for the study was supported by its good internal consistency (Cronbach's $\alpha = 0.84$).

Study Variables

The independent variable was the structured PNVs. Dependent variables included preoperative anxiety. Confounders such as age, sex, type of surgery, and comorbidities were considered during analysis.

Data Analysis

SPSS version 27.0 was used to analyse the data. Clinical and socio-demographic traits were presented using descriptive statistics. Chi-square and independent t-tests were used to evaluate correlations between continuous and categorical data. Statistical significance was defined at $p \leq 0.05$, and the APAIS tool was modified by collapsing response options into three levels: mild, moderate, and severe categories based on threshold reported in previous study¹⁴ even though, the original item scoring was preserved, only categories were collapsed post-scoring. Future studies should employ multivariate analyses to adjust for demographic differences such as education and ethnicity to provide stronger evidence about the relationship between PNVs and reduced PA.

Ethical Considerations

Approvals for the study was obtained from the Ministry of Health Kaduna State (NHRE/17/03/2018), and ABUTH Zaria (NHREC/ABUTH-HREC/29/08/23) Research and Ethics Committees. Confidentiality and anonymity were guaranteed, and written informed consent was obtained. Participants were free to leave at any moment.

RESULTS

There were 204 patients in all, 102 of whom were recruited from the intervention facility and 102 in the control hospital. Many SPs were aged 28–32 years (34.3% as against 37.3%). Occupationally, most participants were civil servants or engaged in business/trade, accounting for nearly two-thirds of both groups. Ethnic distribution showed that the treatment group was predominantly Hausa/Fulani (53.9%), whereas the control group was more diverse, with Hausa/Fulani (41.2%) and other ethnicities (31.4%) being most common. In terms of marital status, 65.7% of both groups were married. With 56.9% of the treatment group and 74.5% of the control group reporting tertiary education, this level of education was the highest. A smaller proportion reported Islamic education (17.6% vs. 4.9%). Religiously, most participants were Muslim (67.6% treatment; 58.8% control), followed by Christians (32.4% as against 38.2%). Notable demographic differences were observed between groups, particularly in education and ethnicity, which may have influenced anxiety outcomes (See Table 1).

The PA levels of patients in the intervention and control groups are compared in Table 2. The intervention group's mean anxiety score (Mean = 2.82) was considerably lower than the control group's (Mean = 3.11), and the difference reached statistical significance ($t = -2.90883$, $p = 0.0098$). Patients in the intervention group reported more worries about anaesthesia and surgery, but a higher proportion expressed moderate to severe concern about the outcome of the operation. Importantly, these patients also demonstrated a stronger desire for information about both anaesthesia and the surgical

procedure, with 81.4% moderately and 36.3% severely interested in additional information about the operation. In contrast, SPs in the control group may likely to have mild or moderate anxiety and showed less demand for detailed information. Although patients in the intervention group expressed moderate concern about surgical outcomes, their overall anxiety scores were low, suggesting that PNVs shifted anxiety toward information seeking behaviour rather than more worry.

Table 3 presents the comparison of PA levels between SPs who received PNVs and those who received routine nursing care. The findings show a clear difference in PA distribution between the two groups. In the intervention group, most patients (63%) reported mild anxiety, compared to only 41% in the control group. Conversely, moderate anxiety was observed among SP in the control group (48%) as compared to the intervention group (26%). Severe anxiety was uncommon in both groups, with similar proportions reported. The intervention group demonstrated a more favourable anxiety level, with a greater proportion of patients falling within the mild anxiety category. The association between PNVs and anxiety category was statistically significant ($\chi^2 = 12.026$, $df = 2$, $p = 0.002$), confirming that PNVs was associated with PA levels.

DISCUSSION

The findings of this study suggest that patients who received PNVs reported mild mean anxiety scores and were more likely to fall within the mild anxiety level compared to those who received routine care. These findings are consistent with global evidence that reported the value of nurse-led preoperative education and psychological support in reducing patient apprehension and improving surgical readiness^(14,15,16,17,18,19). These findings align with studies from Osun and Borno States in Nigeria, which demonstrated that structured counselling and education reduced anxiety and postoperative pain^(12, 14). This result also supported evidence that states, informed SPs experienced reduced PA⁽²⁰⁾. The effect of PNVs experienced by SPs is likely attributed to improved knowledge, clarification of misconceptions, enhanced patient–nurse communication, and emotional reassurance.

An interesting observation was the increased information-seeking behaviour among patients in the intervention group. This is not indicative of anxiety but rather reflects the heightened engagement and preparedness of patients. These outcomes were also documented in previous studies^(5, 21, 22, 23, 24). In addition, PNVs may reduce the intensity of preoperative anxiety by channelling it into proactive information-seeking⁽²⁵⁾.

The demographic patterns suggest that young to middle-aged adults with higher educational attainment SPs may influence the association with PNVs, although this requires further exploration. Prior studies have shown that health literacy and support are significant factors in postoperative recovery⁽²⁶⁾. These findings suggest that tailoring PNVs to diverse patient profiles, including those with low literacy or limited support, could benefit from it effect in resource-constrained settings strengthens the relevance of PNVs in Nigeria. Contrary findings reported among surgical patients found no significant effect of PA on postoperative outcomes (27) this may relate to differences in complexity, severity and patient expectations. This disparity may reflect differences on the surgery type, patient population, ethnicity or the quality and duration of PNVs as supported by^(28,29) who argued that family support or patient knowledge alone may not significantly reduce PA.

The study's strengths include standardised intervention delivery, adequate sample size, and use of a validated instrument. However, one of the limitations of this study is the non-equivalent control group design, with the intervention group drawn from ABUTH and the control group from BDTH. Differences in hospital culture, routine nursing practices, patient demographics and surgical teams may independently influence anxiety levels. This study also employed a post-test only design, baseline anxiety levels were not measured. It is therefore not possible to confirm equivalence between groups at the outset. The observed differences in post-intervention scores may partly reflect pre-existing differences between patients at ABUTH and BDTH, which limits the internal validity of the findings. Therefore, while the findings

suggest that PNVs are associated with reduced anxiety, the possibility that hospital-level differences contributed to the observed effects cannot be excluded. A randomized controlled trial within the same hospital would provide stronger causal evidence. Due to patient flow, bed space arrangement and the possibility of contamination, we are unable to evaluate the baseline PA and verify its impact between groups before intervention. Furthermore, differences in education and ethnicity between the two facilities may have influenced anxiety outcomes. Despite these limitations, the findings provide promising evidence supporting the integration of PNVs into routine preoperative care pathways in Nigeria.

CONCLUSION

In this study, SPs who received PNVs reported lower anxiety scores compared to those receiving routine nursing care. While the design does not permit causal conclusions, the findings suggest that nursing visits may be a useful approach to reducing preoperative anxiety and enhancing patient preparedness in Nigerian tertiary hospitals. Future research using randomized control designs and multivariate adjustment is needed to confirm these associations.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Table 1: Demographic Characteristics of Patients (n = 204)

Variables	Study (n = 102)		Control (n = 102)	
	F	%	F	%
Age group				
18–22	11	10.8	9	8.8
23–27	31	30.4	22	21.6
28–32	35	34.3	38	37.3
33–37	13	12.7	20	19.6
38–42	6	5.9	6	6.9
≥43	6	5.9	7	6.9
Occupation				
Civil servant	37	36.3	34	33.3
Business/trade	34	33.3	28	27.5
Unemployed	14	13.7	12	11.8
Student	10	9.8	13	12.7
Retired	7	6.9	8	7.8
Others	0	0.0	7	6.9
Ethnicity				
Hausa/Fulani	55	53.9	42	41.2
Igbo	13	12.7	12	11.8
Yoruba	15	14.7	16	15.7
Others	19	18.6	32	31.4
Marital status				
Single	26	25.5	15	14.7
Married	67	65.7	67	65.7
Divorced	5	4.9	12	11.8
Widow	4	3.9	8	7.8
Education				
Primary	1	1.0	0	0.0
Secondary	21	20.6	21	20.6
Tertiary	58	56.9	76	74.5
Islamic	18	17.6	5	4.9
None	4	3.9	0	0.0
Religion				
Muslim	69	67.6	60	58.8
Christian	33	32.4	39	38.2
Others	0	0.0	3	2.9

Table 2: Distribution of Preoperative Anxiety Levels among Patients

Anxiety	Intervention (n = 102)						Control (n = 102)					
	Mild		Moderate		Severe		Mild		Moderate		Severe	
	F	%	F	%	F	%	F	%	F	%	F	%
Worried about anaesthesia	51	50.0	51	50.0	0	0.0	47	46.1	48	47.1	7	6.9
Worried about operation	32	31.4	28	27.5	42	41.2	41	40.2	44	43.1	17	16.7
Worried about operation outcome	34	33.3	22	21.6	46	45.1	38	37.3	55	53.9	9	8.8
Require more information about anaesthesia	16	15.7	83	81.4	3	2.9	30	29.4	56	54.9	16	15.7
Require more information about operation	21	20.6	40	39.2	40	39.2	26	25.5	53	52.0	17	16.7
Aggregate mean %	31	30.4	45	44.1	26	25.5	19	18.6	51	50.0	12	11.8
Aggregate mean score	2.82						3.11					
t = -2.90883, p = 0.0098												

Table 3: Effect of Perioperative Nurse Visits on Preoperative Anxiety Levels

Perioperative Nurse Visits	Anxiety Level			X ² (df)	p-value
	Mild	Moderate	Severe		
Intervention	64 (62.7)	26 (25.5)	12 (11.8)	12.026 (2)	0.002
Control	42 (41.2)	49 (48.0)	11 (10.8)		
Total	106 (51.9)	75 (36.8)	23 (11.3)		