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NURSING PROCESS UTILIZATION AND ITS PREDICTORS IN A KENYAN HOSPITAL

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ABSTRACT

Background: The nursing process (NP) is an essential systematic framework for delivering high-quality, safe, and patient-centered care; however, its implementation is often inconsistent, particularly in resource-limited healthcare settings. This study aimed to identify nurse-associated predictors influencing the utilization of the NP among nurses from different departments at Mater Misericordiae Hospital, Nairobi, Kenya.

Methodology: An analytical cross-sectional study design was employed. Stratified random sampling was used to select 164 nurses from Specialized Care Units (Neonatal Intensive Care Unit [NICU] and Intensive Care Unit [ICU]), Medical, Surgical, Outpatients, Emergency, Maternity, and Paediatric departments. Data were collected using structured questionnaires and analysed using both descriptive and inferential statistics, including Mann-Whitney U tests, Kruskal-Wallis tests, and binary logistic regression.

Results: Of the 164 nurses surveyed, 76.2% (n=125) demonstrated high nursing process (NP) utilization. The diagnosis step had the lowest implementation rate (70.7%, n=116) among the NP steps. Bivariate analysis revealed significant associations between NP utilization and education level (p=.018), years of experience (p=.015), current role (p=.027), knowledge (p=.013), confidence (p=.001), training frequency (p=.005), and support (p=.012). Multivariate analysis identified confidence (AOR=4.13, 95% CI [1.14, 14.90], p=.030) and higher education level (AOR=0.54, 95% CI [0.31, 0.94], p=.030) as significant independent predictors. Staff nurses had significantly higher NP utilization than nurse managers (p=.027).

Conclusion: Overall NP utilization was high, but the diagnosis step was poorly implemented. The most significant independent predictors of high-quality NP utilization were nurse's confidence and their level of education. Therefore, healthcare facilities should focus on implementing targeted interventions

focusing on boosting nurses' confidence through regular hands-on training, mentorship programs, and supportive work environment to enhance NP utilization.

Keywords: Nursing Process, Utilization, Nurse Factors, Confidence, Training,

INTRODUCTION

The nursing process (NP) is an essential, systematic framework for delivering holistic and patient-centred care ¹. It comprises the consecutive yet cyclically interdependent steps of assessment, diagnosis, planning, implementation, and evaluation. Each step of NP informs and influences the others in a continuous process of evaluation, refinement, and modification ¹. Effective application of NP ensures high care quality, promotes patient safety, and prevents clinical errors. By promoting structured decision-making and intervention ^{2,3}.

Despite the importance of NP in patient care, its application in clinical settings remains inconsistent and incomplete globally ^{4,5}. The problem is even more extensive and serious in healthcare settings in low- and middle-income countries ^{6,7}. In the African healthcare context, empirical evidence highlights substantial variability and suboptimal implementation of the nursing process ^{2,8}. For instance, a systematic review and meta-analysis conducted in Ethiopia reported a pooled NP implementation prevalence of just 42.44% among nurses ². This is seriously low and translates to poor quality patient care.

In Kenya, effective NP utilization is indisputably inconsistent and suboptimal ^{6,7}. Studies have identified significant barriers,

including negative attitudes among nurses who perceive the process as overly time-consuming, widespread knowledge gaps, and critical institutional constraints such as understaffing ⁷⁻⁹. Additionally, NP underutilization is attributed to multifactorial barriers, including excessive workload and inadequate staffing ratios ^{7,10}. Furthermore, insufficient material resources and limited institutional support for standardized nursing care protocols also contribute to inconsistent NP application ^{7,11}.

In terms of nurse-related factors, existing empirical evidence has highlighted that factors, such as knowledge deficits, educational attainment, and professional experience of the nurses, significantly influence NP utilization ^{11,12}. Existing research evidence have identified that knowledge, training, and experience as influential factors for NP utilization among nurses ^{2,7}. Nonetheless, the existing evidence does not sufficiently statistically isolate which factors are most predictive of NP utilization amidst potential confounders ¹⁰⁻¹². Therefore, this study aimed to bridge this knowledge gap by identifying the key nurse-associated predictors of nursing process utilization among nurses at Mater Misericordiae Hospital in Nairobi, Kenya.

METHODS

Study Design

This study utilized an analytical cross-sectional study design, which is an observational approach that enabled simultaneous collection of data on both the level of nursing process utilization (outcome) and potential nurse-related predictors (e.g., education, confidence, training, and support) at a single point in time.

Study Setting

This study was conducted at Mater Misericordiae Hospital in Nairobi, Kenya. The hospital was registered as a private faith-based institution providing extensive general and specialized care services, including curative, preventive, promotive, and rehabilitative services. The hospital had a total bed capacity of 176 and served a large population of patients from various parts of the country.

Target Population

The target population is composed of a total of 219 nurses directly involved in providing nursing care in different departments, including medical, surgical, Paediatric, maternity, intensive care unit (ICU), neonatal intensive care unit (NICU), and outpatient departments. The diversity of the departments expanded the nursing population and provided a varied perspective of nurses regarding the NP utilization.

Eligibility Criteria

This study included nurses who were employed on a permanent or contract basis and actively engaged in direct patient care.

The nurses had a minimum of three months of tenure at the hospital to ensure familiarity with institutional protocols. The study excluded nurses on locum or probationary status, those working less than five days per week, individuals on any form of leave during the data collection period, student nurses or interns, and any staff who declined to provide informed consent.

Sample Size

The sample size for this study was determined using Yamane's (1967) simplified formula for a finite population¹³. The formula was: $n = N/(1+N(e^2))$, where n = the sample size; N = the population under study; e = signifies the margin of error or a constant. Thus, with a total target population (N) of 219 nurses working in direct patient care units, and a margin of error (e) set at 3.5% to enhance precision and account for potential non-response, the calculated minimum sample size was 173 nurses.

Sampling Technique

A stratified random sampling technique was employed to ensure a representative and proportional distribution of participants across the diverse clinical departments within the hospital. The target population ($N=219$) was first divided into six homogeneous strata based on their department: Specialised Care Units, Medical, Surgical, Outpatients and Emergency, Maternity, and Paediatric. The number of participants to be included from each department was calculated proportionally by dividing the number of nurses in the department by the total population (219 nurses), and the outcome was multiplied by

173 (sample size). Thus, the number of nurses derived from specialized care units was 22; medical were 36; surgical were 33; Outpatient and Emergency were 32; maternity were 25; and pediatric were 25. Finally, participants within each department were selected using a simple random sampling method to enhance the representativeness of the sample and enhance the generalizability of the findings across all nursing units involved in direct patient care.

Methods and Instruments of Data Collection

Data were collected using a structured, interviewer-administered questionnaire, which comprised three sections: demographic characteristics, nursing process utilization, and nurse-associated factors. The questionnaire was pre-tested using 17 nurses (10% of the sample) from a similar setting to ensure reliability, clarity, and relevance. Data from the pre-test were excluded from the final analysis. Trained research assistants administered the questionnaire.

Techniques to Minimize Bias

Selection bias was mitigated by implementing a stratified random sampling technique that ensured all clinical departments were proportionally represented, giving every eligible nurse an equal chance of being selected. Measurement bias was addressed by using a structured, pre-tested questionnaire, which identified and resolved ambiguous items, and improved the instrument clarity and reliability¹⁴⁻¹⁶. Social desirability bias was mitigated by assuring the participants of

anonymity and confidentiality, with no personally identifiable information collected on the questionnaires.

Data Management and Analysis

Collected questionnaires were checked for completeness, cleaned, coded, and entered into SPSS version 26 for statistical analysis. Descriptive statistics were used to summarize demographic characteristics and the level of NP utilization. Given the ordinal nature of the data and its non-normal distribution, confirmed by the Shapiro-Wilk test, non-parametric tests were employed for bivariate analysis. The Mann-Whitney U test was used to compare NP utilization between two groups, and the Kruskal-Wallis H test was used for comparisons across more than two categories, with post-hoc Bonferroni corrections. Further binary logistic regression analysis was done to identify the independent nurse-associated predictors of high NP utilization, controlling for potential confounders. Results were presented as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI), and a p-value of less than .05 was considered statistically significant.

Outcome Measure

The primary outcome was the level of NP utilization, treated as a binary variable. The level of utilization of NP was determined objectively using an ordinal ranking method, which involved assigning each response option in the Likert-type question a numerical value (Always = 5, Often = 4, Sometimes = 3, Rarely = 2, and Never = 1). The number of respondents for each response was then multiplied by the

assigned score to generate a weighted total, which enabled the calculation of a mean utilization score ^{14–16}. The mean score was used to categorize responses as either high utilization or low utilization. The secondary variable outcomes were nurse-associated factors, such as knowledge, confidence, motivation, and workload impact, among others.

Ethical Considerations

Ethical approval was granted by the Mount Kenya University Institutional Scientific Ethics Review Committee (Approval number 3166) and the National Commission for Science, Technology, and Innovation (NACOSTI) (License No. NACOSTI/P/24/40799) before commencement. Permission to conduct the research was also obtained from the management of Mater Misericordiae Hospital. The principle of voluntary participation was strictly upheld. Written informed consent was obtained from each participant. To ensure confidentiality and anonymity, no personal identifiers were collected on the data collection tools.

RESULTS

Demographic Characteristics of the Study Participants

Out of 173 distributed questionnaires, 164 were completed (response rate: 94.8%). Female nurses composed 73.8% (n = 121) of the participants. The largest age group of participants was 20–29 years (58.5%, n = 96), followed by 30–39 years (32.9%, n = 54) (Table 1). Educationally, 54.9% (n = 90) were diploma holders, 19.5% (n = 32) had a higher diploma, 18.3% (n = 30) had a bachelor's degree, and 7.3% (n = 12) had a master's degree. Regarding work experience, 1–5 years (38.4%, n = 63) was most common, followed by <1 year (22.6%, n = 37) (Table 2). In terms of employment status, 76.8% (n = 126) were permanently employed, while 23.2% (n = 38) were on contract employment. Staff nurses composed 79.3% (n = 130), while nurse managers were 11.6% (n = 19). Most of the nurses were from outpatient and emergency (25.0%, n = 41), followed by medical (23.2%, n = 38) (Table 1).

Table 1

Demographic Characteristics of Participants (N = 164)

Variable	Frequency (n)	Percentage (%)
Gender		
Female	121	73.8
Male	43	26.2
Age Group		
20–29 years	96	58.5
30–39 years	54	32.9
40–49 years	8	4.9
50 years and above	6	3.7
Nursing Education Level		
Diploma	90	54.9
Higher Diploma	32	19.5

Bachelor Degree	30	18.3
Master's Degree	12	7.3
Years of Experience		
Less than 1 year	37	22.6
1–5 years	63	38.4
6–10 years	36	22.0
More than 10 years	28	17.1
Employment Contract		
Permanent	126	76.8
Contract	38	23.2
Current Role		
Staff Nurse	130	79.3
Nurse Manager	19	11.6
Unit Head	15	9.1
Current Department		
Specialized Care Units	23	14.0
Medical	38	23.2
Surgical	31	18.9
Outpatients and Emergency	41	25.0
Maternity	15	9.1
Paediatric	16	9.8

Level of NP Utilization in Patient Care Among Nurses

The nurses rated how frequently they applied the nursing process in their daily patient care on a five-point Likert scale (Always, Often, Sometimes, Rarely, and Never). Most nurses, 61.0% (n = 100), reported Always, 15.2% (n = 25) reported Often, 11.6% (n = 19) indicated Sometimes, 7.3% (n = 12) Rarely, and 4.9% (n = 8) reported Never. Through ordinal ranking, a total

weighted score of 689 was obtained from 164 responses. Dividing this score by the total number of responses yielded a mean NP utilization score of 4.2. Thus, the high utilization was considered to be a mean score above 4.0, while low utilization was considered a mean score below 4.0. From this, most nurses reported High utilization of the NP in daily practice (76.2%, n = 125), while the remaining 23.8% (n = 39) reported Low NP utilization (Figure 1).

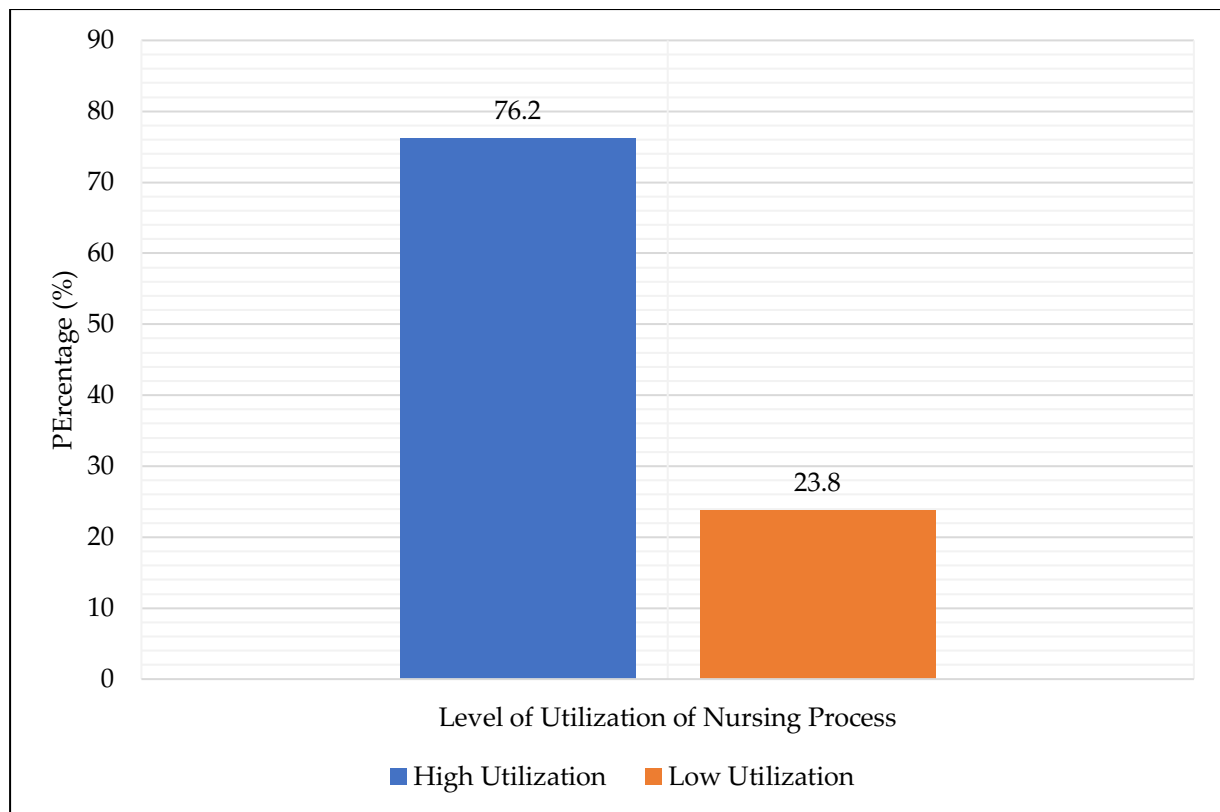


Figure 1. Level of Utilization of Nursing Process Among Nurses

Frequency of Implementation of Each Step of NP Routinely Practiced by Nurses

Assessment was the most consistently implemented step, with 95.1% (n= 156) of nurses reporting routine use, followed

closely by implementation (98.8%, n= 162) and evaluation (93.9%, n= 154) (Figure 2). Planning was also frequently applied, though slightly less (81.1%, n= 133), while diagnosis had the lowest implementation rate (70.7%, n= 116), among the nurses.

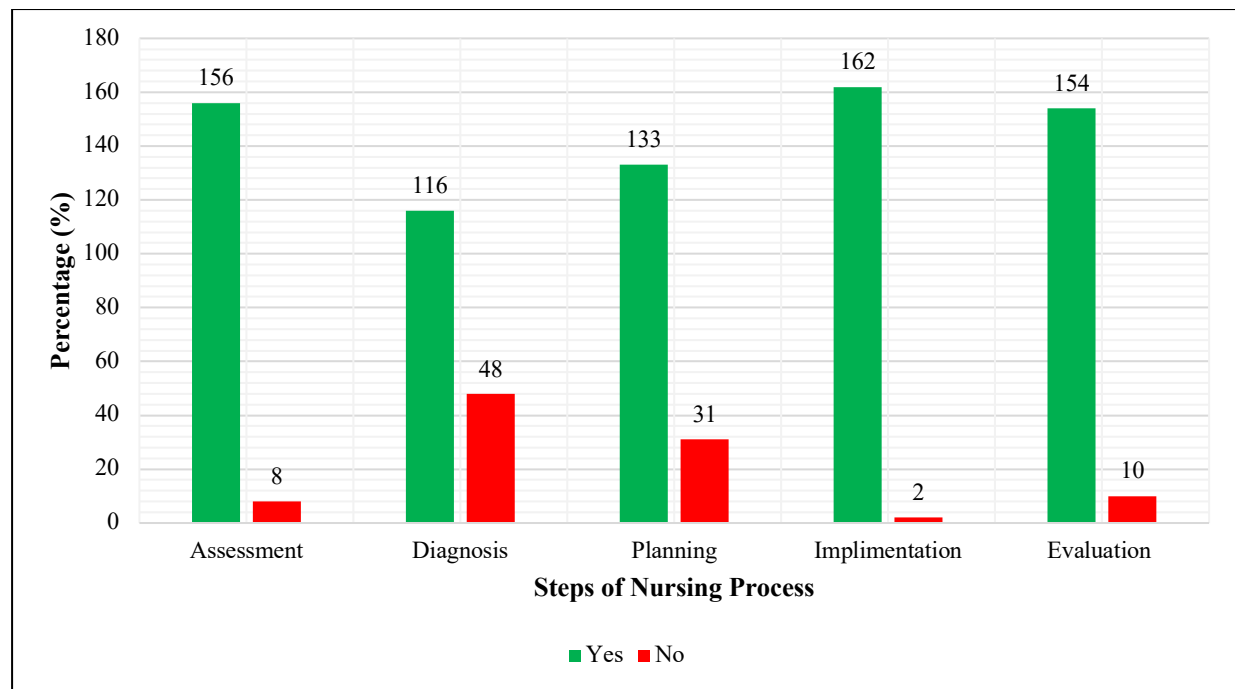


Figure 2. Steps of Nursing Process Routinely Implemented

Utilization of NP Across the Participants' Demographics

Notable variations in NP utilization were observed across demographic factors in our sample of 164 nurses. While descriptive trends showed higher utilization rates among male nurses (81.4% vs 74.4%), contract staff (84.2% vs 73.8% for permanent staff), and those with specialized education (88.6% for higher diploma/master's holders vs 67.8% for diploma nurses), inferential analyses revealed more nuanced patterns (Table 2). The Mann-Whitney U test indicated that staff nurses demonstrated significantly higher NP utilization than nurse managers ($U = 1807.00$, $z = -2.22$, $p = .027$).

Kruskal-Wallis tests revealed significant differences across education levels ($H(2) = 8.07$, $p = .018$) and years of experience ($H(3) = 10.48$, $p = .015$), with post-hoc analyses showing specialized nurses had significantly higher utilization than diploma holders ($p = .024$), and nurses with 6-10 years' experience outperformed those with less than one year of experience ($p = .020$) (Table 2). Interestingly, despite apparent descriptive differences, no statistically significant variations were found for gender ($U = 2419.00$, $p = .355$), age groups ($H(2) = 1.20$, $p = .548$), employment status ($U = 2145.00$, $p = .188$), or clinical department ($H(5) = 2.46$, $p = .782$) (Table 2).

Table 2*Differences in NP Utilization Across Demographic Variables (N = 164)*

Variable	Total n (%)	High utilization n (%)	Low utilization n (%)	Mean Rank	Test Statistics	p
Gender						
Female	121 (73.8%)	90 (74.4%)	31 (25.6%)	84.01	U= 2419.00	.355
Male	43 (26.2%)	35 (81.4%)	8 (18.6%)	78.26		
Age of Participants						
20–29 years	96 (58.5%)	74 (77.1%)	22 (22.9%)	81.79	H = 1.204	.548
30–39 years	54 (32.9%)	42 (77.8%)	12 (22.2%)	81.22		
≥40 years	14 (8.5%)	9 (64.3%)	5 (35.7%)	92.29		
Nursing Education Level						
Diploma	90 (54.9%)	61 (67.8%)	29 (32.2%)	89.42	H = 8.069	.018
Bachelor's Degree	30 (18.3%)	25 (83.3%)	5 (16.7%)	76.67		
Specialized (Higher Diploma/Master's)	44 (26.8%)	39 (88.6%)	5 (11.4%)	72.32		
Years of Experience						
<1 year	37 (22.6%)	21 (56.8%)	16 (43.2%)	98.46	H = 10.476	.015
1–5 years	63 (38.4%)	51 (81.0%)	12 (19.0%)	78.62		
6–10 years	36 (22.0%)	31 (86.1%)	5 (13.9%)	74.39		
>10 years	28 (17.1%)	22 (78.6%)	6 (21.4%)	80.57		
Employment Status						
Permanent	126 (76.8%)	93 (73.8%)	33 (26.2%)	84.48	U= 2145.00	.188
Contract	38 (23.2%)	32 (84.2%)	6 (15.8%)	75.95		
Current Role						
Staff Nurse	130 (79.3%)	104 (80.0%)	26 (20.0%)	79.40	U= 1807.00	.027
Nurse Manager	34 (20.7%)	21 (61.8%)	13 (38.2%)	94.35		
Current Department						
Specialized Care Units	23 (14.0%)	18 (78.3%)	5 (21.7%)	80.83	H = 2.463	.782
Medical	38 (23.2%)	28 (73.7%)	10 (26.3%)	84.58		
Surgical	31 (18.9%)	24 (77.4%)	7 (22.6%)	81.52		
Outpatients & Emergency	41 (25.0%)	34 (82.9%)	7 (17.1%)	77.00		
Maternity	15 (9.1%)	10 (66.7%)	5 (33.3%)	90.33		
Paediatric	16 (9.8%)	11 (68.8%)	5 (31.3%)	88.63		

Multivariate Analysis of Demographic Predictors of Low NP Utilization

A binary logistic regression was conducted on the nurses' demographic variables that were found to be significant during bivariate analysis. They included nurses' education level, years of experience, and current role. The model demonstrated best fit to the data (Nagelkerke $R^2 = .13$, Hosmer-Lemeshow $\chi^2 (7) = 9.44$, $p = .222$), and was statistically significant in overall ($\chi^2 (3) = 14.38$, $p = .002$)

(Table 3). The test identified that nurses with higher education levels had significantly lower odds of low NP utilization (AOR = 0.55, 95% CI [0.33, 0.92], $p = .022$). Despite not being statistically significant, nurses with more years of experience (AOR = 0.72, 95% CI [0.49, 1.07], $p = .105$) (Table 3). Similarly, staff nurse roles (AOR = 0.49, 95% CI [0.21, 1.14], $p = .099$) also showed a trend toward lower odds of low NP utilization compared to nurses' managers.

Table 3*Demographic Predictors of Low Utilization of Nursing Process (N = 164)*

Predictor	B	SE	Wald	P	AOR	95% CI
Level of Nursing Education	-0.61	0.27	5.25	.022	0.55	[0.33, 0.92]
Years of Experience	-0.32	0.20	2.63	.105	0.72	[0.49, 1.07]
Current Role (Staff Nurse)	-0.71	0.43	2.72	.099	0.49	[0.21, 1.14]

Nurse-Associated Factors Influencing NP Utilization in Patient Care

Descriptive results showed notably higher NP utilization rates among nurses with good knowledge (78.4% vs 45.5%), confidence (79.7% vs 43.8%), regular training (87.1% vs 68.1%), and collegial support (85.3% vs 68.5%) (Table 4). Mann-Whitney U tests confirmed these differences were statistically significant for knowledge ($U = 564.00$, $z = -2.47$, $p = .013$), confidence ($U = 758.00$, $z = -3.20$, $p = .001$), training frequency ($U = 2663.00$, $z = -2.83$, $p = .005$), and support ($U = 2777.00$, $z = -2.51$, $p = .012$) (Table 4).

Perceived importance of NP showed a marginally significant association ($U = 743.00$, $z = -1.97$, $p = .049$), while motivation was the only factor that did not reach statistical significance ($U = 3227.00$, $z = -0.57$, $p = .571$) (Table 4). The analysis revealed mean rank differences across all factors, with confident nurses showing lower mean ranks ($M = 79.62$) than unconfident nurses ($M = 109.13$), and regularly trained nurses demonstrating lower mean ranks ($M = 73.54$) than infrequently trained nurses ($M = 89.17$) (Table 4). Supported nurses showed mean ranks of 75.03 compared to 88.80 for unsupported nurses (Table 4).

Table 4*Nurse-Associated Factors Influencing NP Utilization (N = 164)*

Variable	Total n (%)	High utilization n (%)	Low utilization n (%)	Mean Rank	Mann-Whitney U	p
Knowledge of NP						
Good	153 (93.3%)	120 (78.4%)	33 (21.6%)	80.69	564.00	.013
Poor	11 (6.7%)	5 (45.5%)	6 (54.5%)	107.73		
Confidence in Using NP						
Confident	148 (90.2%)	118 (79.7%)	30 (20.3%)	79.62	758.00	.001
Not Confident	16 (9.8%)	7 (43.8%)	9 (56.3%)	109.13		
Importance of Using NP						
Important	151 (92.1%)	118 (78.1%)	33 (21.9%)	80.92	743.00	.049
Not Important	13 (7.9%)	7 (53.8%)	6 (46.2%)	100.85		
Frequency of Training on NP						
Regular Training	70 (42.7%)	61 (87.1%)	9 (12.9%)	73.54	2663.00	.005
Infrequent/No Training	94 (57.3%)	64 (68.1%)	30 (31.9%)	89.17		

Support from Colleagues						
Agree (Support Present)	75 (45.7%)	64 (85.3%)	11 (14.7%)	75.03	2777.00	.012
Disagree (Lack Support)	89 (54.3%)	61 (68.5%)	28 (31.5%)	88.80		
Motivation to Use NP						
Motivated	86 (52.4%)	64 (74.4%)	22 (25.6%)	83.98	3227.00	.571
Unmotivated	78 (47.6%)	61 (78.2%)	17 (21.8%)	80.87		

Multivariate Analysis of Nurse-Associated Predictors of Low NP Utilisation

A binary logistic regression analysis was conducted to assess the nurse-related factors that predicted low NP utilization in daily patient care (Table 5). The model demonstrated adequate fit to the data (Nagelkerke $R^2 = .27$, Hosmer-Lemeshow $\chi^2(8) = 14.40$, $p = .072$). The model was adjusted for current role, level of nursing education, and years of experience. Nurses with greater confidence in using the NP had 4.13 times higher odds of high NP utilization

(AOR = 4.13, 95% CI [1.14, 14.90], $p = .030$), while more educated nurses showed lower odds of low NP utilization (AOR = 0.54, 95% CI [0.31, 0.94], $p = .030$) (Table 5). Several factors, such as frequency of training (AOR = 2.41, 95% CI [0.95, 6.09], $p = .063$) and support from colleagues (AOR = 2.33, 95% CI [0.94, 5.76], $p = .067$), were not statistically significant, but showed positive associations with NP utilization. Current role (AOR = 0.55, $p = .200$), years of experience (AOR = 0.80, $p = .306$), perceived importance (AOR = 1.92, $p = .360$), and knowledge (AOR = 0.87, $p = .865$) were not significant predictors.

Table 5

Nurse-Associated Factors Predicting Low NP Utilization (N = 164)

	B	SE	Wald	P	AOR	95% CI
Knowledge of NP	-0.14	0.80	0.03	.865	0.87	[0.18, 4.21]
Confidence in Using NP	1.42	0.66	4.69	.030	4.13	[1.14, 14.90]
Importance of Using NP	0.65	0.71	0.84	.360	1.92	[0.48, 7.71]
Frequency of training	0.88	0.47	3.44	.063	2.41	[0.95, 6.09]
Support from colleagues	0.85	0.46	3.35	.067	2.33	[0.94, 5.76]
Current Role (Staff Nurse)	-0.61	0.47	1.64	.200	0.55	[0.22, 1.38]
Level of Nursing Education	-0.61	0.28	4.70	.030	0.54	[0.31, 0.94]
Years of Experience	-0.22	0.21	1.05	.306	0.80	[0.53, 1.22]

DISCUSSION

This study identified a considerably high rate of NP utilization, conceivably explained by the hospital's emphasis on professional standards and structured nursing care ¹⁷.

Assessment and implementation were the most applied steps, while the diagnosis step was the least implemented. This indicated that while nurses are skilled in data gathering and task execution, the crucial intermediate step of clinical reasoning and

problem identification remains a challenge^{18,19}. Moreover, the disparity indicates a potential gap in translating assessed data into a formalized diagnostic statement^{1,4,20}. The challenge with formulating nursing diagnoses is a well-documented global issue^{5,6}. This is often attributed to inadequate training and a lack of mastery of standardized terminologies like NANDA^{5,6}.

This study identified that a nurse's confidence was the single strongest independent predictor of high NP utilization, followed by higher education levels. This highlights that, beyond theoretical knowledge, confidence and self-efficacy are required for effective application of the NP^{12,19}. The importance of confidence in NP utilization identified by this study has been confirmed by existing studies that identify self-efficacy as a critical driver of clinical performance including enabling nurses to navigate complex patient needs systematically^{9,10}.

The positive association between education level and NP utilisation is consistent with existing research. For instance, studies have identified that nurses with bachelor's degrees or higher demonstrate better adherence to standardized care protocols than their diploma-prepared colleagues^{4,18,21}. Moreover, higher education level enhances nurses confidence and promote consistent NP utilization^{7,11,12,22}. Thus, the consistency across contexts highlights that the challenges of translating NP theory into practice are universal.

The key implication is that interventions focusing on improving NP utilization must move beyond basic NP training to enhancing

the diagnostic reasoning skills and confidence of the nurses^{3,4,9}. Consequently, nursing leadership should prioritize strategies that strengthen clinical reasoning and promote care standardization through the routine use of the NP among nurses. Targeted mentorship, simulation-based training, and supportive supervision can reinforce NP use. Recognizing and rewarding adherence to the NP may further motivate consistent practice and improve care quality.

Study Limitations

The key limitation is that the cross-sectional design only provided a snapshot of NP utilization and did not establish causal relationships between the nurse-related factors and NP utilization. Additionally, the study was conducted in a single private tertiary hospital, which may limit the generalizability of the findings to public hospitals. Future research should include a multi-center longitudinal design that incorporates objective measures of NP documentation.

CONCLUSION

The utilization of the NP was considerably high, but the diagnosis step was not consistently implemented. The nurse's confidence and their level of education were the most critical independent predictors of high-quality NP utilization. The key recommendation is that there should be a targeted training and mentorship programme focused on enhancing the diagnostic reasoning and clinical confidence of nurses. This is to improve their NP application in patient care.

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Credit Statement

CWG conceptualized and prepared the first draft, while CM, RR refined the manuscript. All authors have read and approved the final version of the manuscript.

Conflict of interest statement

The authors declare no competing or conflicting interests in relation to this study.

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