

# Factors Affecting the Implementation of the Nursing Process in Tertiary Hospitals: A Cross-Sectional Study

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## ABSTRACT

**OBJECTIVE:** To identify and examine the factors that hinder the effective implementation of the nursing process in tertiary health care settings in Saudi Arabia.

**METHODOLOGY:** A descriptive cross-sectional study was conducted among 182 registered nurses with at least one year of experience in tertiary hospitals in Makkah, Saudi Arabia, recruited through hospital administration using a systematic random sampling technique. A structured questionnaire, adapted from Owusu-Ansah YA and Agyeman-Yeboah J, was used to collect data on demographic characteristics and factors at the knowledge, individual, and health system levels that affect the implementation of the nursing process. Data were analyzed using descriptive statistics, and chi-square tests were performed to assess associations and predictors of barriers to the implementation of the nursing process ( $p < 0.001$ ).

**RESULTS:** Knowledge of the nursing process varied, with gaps in understanding its structured framework and care plan, while most nurses recognized its continuity, patient involvement, and role in quality care. Certain aspects of knowledge were significantly associated with academic qualification and clinical experience, whereas professional rank had minimal influence. Individual-level factors showed limited associations with qualification, rank, or experience, and health system factors were largely unassociated with nurse characteristics, except that participation in training and workshops was significantly associated with qualification and experience.

**CONCLUSION:** The study reveals a diverse spectrum of knowledge among nurses regarding the nursing process and its components. Addressing context-specific factors that may facilitate or hinder the implementation of the nursing process is essential for effective patient care and patient safety.

**KEYWORDS:** Factors, implementation, nursing process, patients, Saudi Arabia

## INTRODUCTION

The essence of nursing has consistently revolved around health promotion and the provision of care and comfort to patients<sup>1</sup>. Nursing encompasses a broad spectrum of responsibilities, extending from performing intricate technical procedures to addressing the patients' physical requirements and acknowledging the emotional, social, and spiritual elements of their well-being<sup>2,3</sup>. Thus, a holistic approach or process that recognizes and attends to various facets of an individual's health and healing journey is necessary.

The nursing process, a pivotal framework in the healthcare system, serves as a dynamic, systematic, and evidence-based approach to provide high-quality care through a structured methodology for assessment, diagnosis, planning, implementation, and evaluation of patient care<sup>4</sup>. The standards provided by the American Nurses Association (ANA) serve as authoritative declarations outlining the actions and behaviors that every registered nurse, irrespective of

their role, patient population, speciality, or work setting, is expected to competently execute<sup>5</sup>. In addition, this method encompasses a series of interconnected steps designed to guide nurses in delivering comprehensive and individualized care<sup>6</sup>. By comprehending the nursing process, nurses acknowledge their pivotal role in care planning, thereby enhancing the relevance of the care provided<sup>7</sup>. Furthermore, the nursing process is not a static blueprint but a dynamic, iterative cycle that demands critical thinking, clinical judgment, and adaptability from healthcare practitioners<sup>8,23</sup>.

The journey commences with a thorough assessment, as nurses collect and analyze pertinent data to understand the patient's unique needs and health status<sup>9</sup>. Subsequently, a meticulously formulated nursing diagnosis informs the development of a care plan tailored to address identified health concerns<sup>9</sup>. The implementation phase sees nurses putting the devised plan into action, providing hands-on care, and employing various interventions to meet the patient's physical, emotional, and psychosocial needs<sup>10</sup>. Despite its recognized importance, the nursing process remains underutilized in many healthcare settings, and several studies have highlighted gaps in its implementation<sup>4,11,12</sup>. For instance, assessment and diagnosis are frequently neglected due to time constraints, while planning and evaluation are often

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perceived as administrative tasks rather than integral components of patient care.

Meanwhile, various factors contribute to the non-implementation or inadequate application of the nursing process<sup>13</sup>, such as the time-consuming and impractical nature<sup>14</sup>, lack of recognition from higher authorities, limited knowledge, insufficient collaboration among professionals, inadequate motivation, involvement in unrelated manual tasks, unclear job descriptions, and overwhelming workloads<sup>13,15</sup>. Moreover, organizational structures, workplace environments, imbalanced nurse-to-patient ratios, insufficient training, and demotivating factors such as low salaries, high patient volumes, and limited resources further hinder this practice<sup>16</sup>. Additionally, nurses' educational levels, knowledge, skills, experience, and the capacity to gather necessary materials also play a significant role in the non-implementation of the nursing process<sup>17</sup>. Furthermore, external factors such as case severity and patient cooperation have also been identified as critical to the successful execution of the nursing process<sup>18</sup>.

Moreover, in Saudi Arabia, the absence of clearly defined job roles, fragmented implementation initiatives, insufficient training programs, and resistance from physicians, nurses, and patients act as barriers to its successful implementation<sup>19</sup>. Additionally, existing methods of communication between nurses and patients fail to adequately address the requirements of patients, primarily attributed to cultural, religious, and linguistic disparities between the healthcare providers and those seeking medical care<sup>20</sup>. Furthermore, the non-cooperative behaviour of physicians and inadequate facilities are additional factors that make it difficult to implement the nursing process in Saudi Arabia<sup>21</sup>.

The rationale for exploring these factors lies in their potential impact on patient outcomes, quality of care, and overall healthcare delivery. In Saudi Arabia, the healthcare system is undergoing rapid reforms under Vision 2030, and understanding these factors may help optimize nursing practices. Thus, this study aimed to explore the factors that impede the implementation of the nursing process in tertiary hospitals. Through systematically examining these factors, the study provides valuable insights to inform targeted interventions. The findings are anticipated to provide a nuanced understanding of the multifaceted challenges nurses encounter in implementing the nursing process, thereby facilitating the development of tailored strategies and policies to improve nursing practice and ultimately elevate the quality of patient care.

## METHODOLOGY

This study used a descriptive cross-sectional design to explore the factors that hinder effective implementation of the nursing process among nurses. This approach facilitated data collection at a single point in time, providing a snapshot of prevailing

conditions. The study was conducted between March to June 2024, across different tertiary healthcare facilities in Makkah, Saudi Arabia, to ensure inclusion of diverse nursing practices and experiences.

The study population comprised registered nurses working in the selected tertiary healthcare facilities. Participant recruitment was coordinated through the hospital administrations. A systematic random sampling technique was used to recruit participants, ensuring a representative, unbiased sample.

Registered nurses working in Saudi Arabia with at least one year of working experience were included in the study. Eligible participants were those actively involved in patient care and related administrative duties and who held a valid nursing license with at least a diploma qualification. Exclusion criteria comprised nursing students, retired nurses, those with less than one year of clinical experience, and nurses who provided incomplete responses to the survey.

The required sample size was calculated using the formula  $n = N / (1 + N(\alpha^2))$  (22), where  $n$  is the sample size,  $N$  is the population size (500), and  $\alpha$  (0.06) is the level of precision or significance, a total of 182 participants were included, with the slightly higher alpha chosen due to the limited availability of nurses meeting the inclusion criteria.

Data were collected using a structured questionnaire adapted from the instrument developed by Ansah O. and Yeboah A.<sup>23</sup>. The questionnaire comprised four main sections. The first section covered the demographic characteristics of the nurses (age, gender, marital status, education, work experience, rank, department, type of hospital, categories of training). The second section assessed nurses' knowledge regarding the nursing process, with responses recorded as true or false. The third section examined individual-level factors—knowledge, attitude, motivation, and confidence — that may hinder the effective implementation of the nursing process. The fourth section focused on health system-related factors, including workload, resource availability, training, monitoring, and administrative support, which could also impede the nursing process<sup>23</sup>. The content validity of the instrument was measured through expert reviews, and a pilot study was conducted to assess its reliability with 20 nurses. Cronbach's alpha was  $>0.75$ ; therefore, no modifications were made to the questionnaire.

The self-administered questionnaire was distributed to nurses across different departments voluntarily. Participants were given adequate time to complete the questionnaire, and the research team was available to address any questions.

Data from the questionnaire were entered into a statistical software program (SPSS; version 21.0), and descriptive statistics, such as frequencies and percentages, were used. Inferential statistics, such as the chi-square test, were employed to determine associations and predictors of barriers to the nursing

process. A  $p < 0.001$  was considered statistically significant.

## RESULTS

A total of 182 nurses were included in the present study, and the age distribution indicated a diverse range, with a significant proportion falling between 36 and 40 years (66; 36.3%). The gender distribution showed a higher percentage of females than males (121; 66.5%;  $p < 0.001$ ). Most of the nurses were married (96; 52.7%), holding at least a BSc (87; 47.8%), or a Master's qualification (73; 40.1%). In terms of work experience, the largest group had 11–15 years of experience (45; 24.7%), followed closely by those with 4–6 years (44; 24.2%) and 1–3 years (39; 21.4%). Regarding job roles, the majority were staff nurses (98; 53.8%), primarily employed in governmental hospitals (166; 91.2%). The most significant proportion of nurses worked in other departments (53; 29.1%), followed by surgical wards (40; 22%) and emergency care units (34; 18.7%). The data also revealed a high rate of nurses in training programs, with workshops (61; 33.5%) being the most common form of training (Table I).

**Table I: Demographic characteristics of the study's participants (n = 182)**

Demographic characteristics	Options	Frequency	Percentage
Age	18-25	3	1.6
	26-30	44	24.2
	31-35	29	15.9
	36-40	66	36.3
	41-45	23	12.6
	46- 50	11	6
	51 and above	6	3.3
Gender	Male	61	33.5
	Female	121	66.5
Marital status	Married	96	52.7
	Single	83	45.6
	Widow/widower	3	1.6
Highest qualification	Diploma	9	4.9
	BSc	87	47.8
	Masters	73	40.1
	PhD	13	7.1
Working experience (years)	1-3	39	21.4
	4-6	44	24.2
	7-10	20	11
	11-15	45	24.7
	16- 20	19	10.4
	≥21	15	8.2
Rank	Staff Nurse	98	53.8
	Nursing supervisor	33	18.1
	Charge Nurse	29	15.9

Rank	Head Nurse	15	8.2
	Quality Nurse	7	3.8
Department/ Unit	Other	53	29.1
	Surgical ward	40	22
	Emergency care	34	18.7
	Critical care unit	30	16.5
	Medical ward	16	8.8
	Neurosurgery ward	9	4.9
	Type of hospital	Private	16
	Governmental	166	91.2
Training	Yes	130	71.42
	No	52	28.57
Categories of training	Workshop	61	33.5
	In-service training	41	22.5
	Personal study	22	12.1
	Colleagues	6	3.3
	Not Applicable	52	28.6

**Table II** summarises nurses' varying perceptions of the nursing process and its components. The majority (64.8%) of the nurses responded incorrectly to the statement that the nursing process follows a problem-solving approach rather than a structured, systematic approach ( $\chi^2 = 16.02$ ,  $p < 0.001$ ), suggesting that many may not fully appreciate its structured framework. Additionally, 54.4% of nurses did not recognize that the care plan is a step in the nursing process ( $\chi^2 = 1.40$ ,  $p > 0.001$ ), indicating a knowledge gap and a lack of consensus.

Most nurses (78%) demonstrated an understanding that the nursing process is an ongoing practice without a defined endpoint ( $\chi^2 = 57.16$ ,  $p < 0.001$ ). Furthermore, 80.2% correctly recognized that it is not limited to critically ill patients ( $\chi^2 = 66.48$ ,  $p < 0.001$ ), and 73.1% correctly indicated that the nursing process should not be limited to a patient's admission ( $\chi^2 = 38.76$ ,  $p < 0.001$ ), reflecting awareness of its continuous application throughout patient care. Knowledge regarding care quality and patient involvement was also high: 91.8% identified its role in assessing quality ( $\chi^2 = 126.94$ ,  $p < 0.001$ ), 84.1% acknowledged it supports continuity ( $\chi^2 = 84.48$ ,  $p < 0.001$ ), and 78.6% understood it involves patients in their care ( $\chi^2 = 59.42$ ,  $p < 0.001$ ). Finally, 77.5% disagreed that steps are independent and static ( $\chi^2 = 54.94$ ,  $p < 0.001$ ), indicating recognition of their dynamic and interrelated nature, though a minority still held misconceptions.

**Table III** presents the association between nurses' qualifications, ranks, and experience and their knowledge of the nursing process. Overall, higher academic qualifications appeared to influence certain aspects of nurses' understanding of the nursing process. Significant associations were observed for

**Table II: Chi-square analysis of nurses' knowledge regarding the nursing process**

Statement	True (%)	False (%)	$\chi^2$
It follows a problem-solving approach rather than a structured, systematic method	64 (35.2)	118 (64.8)	16.02 <sup>*</sup>
Care plan is a step of the nursing process	83 (45.6)	99 (54.4)	1.40 <sup>**</sup>
It is a continuous practice that does not have a defined endpoint	142 (78)	40 (22)	57.16 <sup>*</sup>
It is applied for critical ill patients only	36 (19.8)	146 (80.2)	66.48 <sup>*</sup>
It is implemented solely upon the patient's admission to the ward	49 (26.9)	133 (73.1)	38.76 <sup>*</sup>
Nurses are not always required to follow the five steps for every patient.	96 (52.7)	86 (47.3)	0.45 <sup>**</sup>
It is designed to assess the quality of care provided to patients	167 (91.8)	15 (8.2)	126.94 <sup>*</sup>
It does not support continuity in patient care	29 (15.9)	153 (84.1)	84.48 <sup>*</sup>
It excludes patients from actively participating in their own care	39 (21.4)	143 (78.6)	59.42 <sup>*</sup>
Each nursing process step works independently and statically	41 (22.5)	141 (77.5)	54.94 <sup>*</sup>

Note: <sup>\*</sup> $p < 0.001$ , <sup>\*\*</sup> $p > 0.001$

**Table III: Association between nurses' qualification, rank, experience, and their knowledge of the nursing process**

Statement	True (%)	False (%)	Qualification $\chi^2$ (df)	Rank $\chi^2$ (df)	Experience $\chi^2$ (df)
It follows a problem-solving approach rather than a structured, systematic method	64 (35.2)	118 (64.8)	3.60 (3) <sup>**</sup>	7.54 (4) <sup>**</sup>	29.74 (5) <sup>*</sup>
Care plan is a step of the nursing process	83 (45.6)	99 (54.4)	6.54 (3) <sup>**</sup>	12.87 (4) <sup>**</sup>	34.88 (5) <sup>*</sup>
It is a continuous practice that does not have a defined endpoint	142 (78)	40 (22)	7.20 (3) <sup>**</sup>	20.92 (4) <sup>*</sup>	11.42 (5) <sup>**</sup>
It is applied for critically ill patients only	36 (19.8)	146 (80.2)	13.91 (3) <sup>**</sup>	3.98 (4) <sup>**</sup>	13.75 (5) <sup>**</sup>
It is implemented solely upon the patient's admission to the ward	49 (26.9)	133 (73.1)	21.15 (3) <sup>*</sup>	14.29 (4) <sup>**</sup>	3.97 (5) <sup>**</sup>
Nurses are not always required to follow the five steps for every patient.	96 (52.7)	86 (47.3)	9 (3) <sup>**</sup>	14.83 (4) <sup>**</sup>	6.35 (5) <sup>**</sup>
It is designed to assess the quality of care provided to patients	167 (91.8)	15 (8.2)	2.69 (3) <sup>**</sup>	7.18 (4) <sup>**</sup>	11.21 (5) <sup>**</sup>
It does not support continuity in patient care	29 (15.9)	153 (84.1)	28.93 (3) <sup>*</sup>	15.92 (4) <sup>**</sup>	11.61 (5) <sup>**</sup>
It excludes patients from actively participating in their own care	39 (21.4)	143 (78.6)	39.67 (3) <sup>*</sup>	10.55 (4) <sup>**</sup>	19.03 (5) <sup>**</sup>
Each nursing process step works independently and statically	41 (22.5)	141 (77.5)	23.71 (3) <sup>*</sup>	9.87 (4) <sup>**</sup>	12.70 (5) <sup>**</sup>

Note: <sup>\*</sup> $p < 0.001$ , <sup>\*\*</sup> $p > 0.001$

knowledge that the nursing process is applied beyond patient admission ( $\chi^2 = 21.15$ ,  $p < 0.001$ ), supports continuity of care ( $\chi^2 = 28.93$ ,  $p < 0.001$ ), includes patients in their own care ( $\chi^2 = 39.67$ ,  $p < 0.001$ ), and that its steps are dynamic and interrelated rather than independent and static ( $\chi^2 = 23.71$ ,  $p < 0.001$ ).

For the remaining items, including knowledge of the structured framework, care plan as a step, application to critically ill patients only, continuous practice, adherence to five steps, and role in quality assessment, associations with qualification were non-significant ( $\chi^2 = 2.69$ – $13.91$ ,  $p > 0.001$ ), suggesting that academic qualification had limited influence on these components of knowledge.

The association between nurses' rank and knowledge of the nursing process was largely non-significant, except of understanding that the nursing process is continuous, which was influenced by rank ( $\chi^2 = 20.92$ ,

$p < 0.001$ ). This suggests that professional rank has a limited impact on most aspects of knowledge. In contrast, experience significantly influenced recognition of the structured framework ( $\chi^2 = 29.74$ ,  $p < 0.001$ ) and the identification of the care plan as a step ( $\chi^2 = 34.88$ ,  $p < 0.001$ ), while other items showed no significant associations ( $\chi^2 = 3.97$ – $19.03$ ,  $p > 0.001$ ). These findings indicate that clinical experience contributes to a better understanding of specific components of the nursing process, whereas rank does not substantially affect knowledge levels.

**Table IV** shows the association between nurses' educational qualification, rank, experience, and individual factors affecting the implementation of the nursing process. For educational qualification, significant associations were observed for perceptions that the nursing process is unclear (majority disagreed, 75.3%), that time constraints affect

**Table IV: Association among nurses' educational qualifications, ranks, experience, and their individual factors affecting nursing process implementation**

Statement	Agree (%)	Disagree (%)	Qualification $\chi^2$ (df)	Rank $\chi^2$ (df)	Experience $\chi^2$ (df)
I think there is no relationship between the nursing process implementation and patient recovery	50 (27.5)	132 (72.5)	14.90 (3)**	21.56 (4)*	4.34 (5)**
Nursing process implementation is one of the nursing manager's responsibilities	25 (13.7)	157 (86.3)	16.35 (3)**	4.89 (4)**	10.60 (5)**
Nursing process implementation is unclear	45 (24.7)	137 (75.3)	38.26 (3)*	8.59 (4)**	13.95 (5)**
I don't have adequate knowledge to implement a nursing process in practice	57 (31.3)	125 (68.7)	11.44 (3)**	8.75 (4)**	4.39 (5)**
Nursing process depends on documentation, which I struggle to maintain during daily work	57 (31.3)	125 (68.7)	12.55 (3)**	15.87 (4)**	10.89 (5)**
Nursing process should not be implemented in clinical settings because of time limitations	41 (22.5)	141 (77.5)	54.94 (3)*	14.50 (4)**	9.12 (5)**
No interest and motivation in including the nursing process in my routine patient care	64 (35.2)	118 (64.8)	12.95 (3)**	9.02 (4)**	29.60 (5)**
Nursing process is an unfamiliar practice that should not be adopted	36 (19.8)	146 (80.2)	39.18 (3)*	24.45 (4)*	16.51 (5)**
Insufficient information from the patient hinders the development of a holistic nursing process	78 (42.9)	104 (57.1)	35.31 (3)*	14.02 (4)**	6.02 (5)**
I lack the confidence to initiate and implement a nursing care plan for my patients	42 (23.1)	140 (76.9)	28.70 (3)*	10.67 (4)**	11.26 (5)**

**Note:** \* $p < 0.001$ , \*\* $p > 0.001$

**Table V: Association of nurses' educational qualification, rank, and experience with health system-related factors affecting nursing process implementation**

Statement	Agree (%)	Disagree (%)	Qualification $\chi^2$ (df)	Rank $\chi^2$ (df)	Experience $\chi^2$ (df)
High patient-to-nurse ratio in clinical settings	123 (67.6)	59 (32.4)	4.70 (3)**	11.04 (4)**	9.04 (5)**
Lack of resources and materials	105 (57.7)	77 (42.3)	12.71 (3)**	4.57 (4)**	23.22 (5)*
Work overload	138 (75.8)	44 (24.2)	5.64 (3)**	8.52 (4)**	10.17 (5)**
No monitoring mechanism	91 (50)	91 (50)	12.05 (3)**	2.04 (4)**	18.44 (5)**
It is not a part of the annual nurses' appraisal	101 (55.5)	81 (44.5)	14.71 (3)**	6.11 (4)**	10 (5)**
Continuous training and workshops are not in place	91 (50)	91 (50)	18.38 (3)*	6.64 (4)**	19.41 (5)**
Hospital administration considers it a framework of care delivery	143 (78.6)	39 (21.4)	13.96 (3)**	11.95 (4)**	26.28 (5)*
Hospital administration reinforces the implementation	119 (65.4)	63 (34.6)	3 (3)**	4.42 (4)**	3.98 (5)**
Hospital administration admires staff for applying the nursing process	121 (66.5)	61 (33.5)	4.36 (3)**	2.43 (4)**	6.55 (5)**
Availability of regular in-service training	117 (64.5)	65 (35.7)	4.38 (3)**	6.35 (4)**	60.95 (5)*

**Note:** \* $p < 0.001$ , \*\* $p > 0.00$

implementation (77.5% disagreed), that it is an unfamiliar practice (80.2% disagreed), insufficient patient information hinders a holistic process (57.1% disagreed), and lack of confidence to initiate a care plan (76.9% disagreed).

For rank, significant associations were found with the perceptions that the nursing process makes no difference to recovery (72.5% disagreed) and that it is an unfamiliar practice (80.2% disagreed). All other statements, including beliefs about manager

responsibility, knowledge gaps, documentation difficulties, time limitations, and motivation, were non-significant across qualification and rank. Further, experience showed no significant associations with any of the individual factors evaluated, suggesting it did not influence nurses' perceptions.

The nurses were asked to indicate their agreement or disagreement with statements about health system factors affecting the implementation of the nursing process. Most statements showed non-significant

associations with educational qualification, rank, and experience. For instance, a high patient-to-nurse ratio, the non-availability of resources, work overload, the lack of monitoring mechanisms, and the absence of annual appraisal were not significantly associated with qualification or rank. Regarding experience, these factors were also largely non-significant, except for the non-availability of resources, where a significant association was observed, with most nurses agreeing. Similarly, significant associations were observed between the lack of periodic training and workshops on the nursing process and qualification. In contrast, experience showed substantial agreement among most nurses that hospital administration considers the nursing process as a framework for care delivery and disagreement that there is insufficient regular in-service training (**Table V**).

## DISCUSSION

The nursing process has long been accepted as a scientific and systematic method for providing high-quality care. Standards of nursing practice in countries such as Canada and the United States also emphasize the adoption of the nursing process as a core framework for professional nursing actions. Therefore, encouraging nurses' participation in training programs that enhance their understanding of the nursing process is strongly recommended<sup>24</sup>. However, despite its adoption, the nursing process still requires more systematic and consistent implementation to achieve optimal outcomes<sup>14</sup>. While nursing theories and practices may vary between countries, addressing patients' needs remains essential for providing high-quality care<sup>25</sup>. In light of the ongoing healthcare reforms under Vision 2030 in Saudi Arabia, understanding the factors that hinder the implementation of the nursing process is critical to improving patient care quality and optimizing nursing practice. Accordingly, this study was designed to examine these factors in tertiary hospitals in Saudi Arabia.

The study revealed a diverse range of knowledge among nurses regarding the nursing process and its components, with a stronger understanding in some areas and weaker in others. Less than half of the participants viewed the nursing process as a problem-solving approach rather than a strictly systematic method. However, there was broad agreement on its cyclical nature and continuous application. Given the varying opinions on critical aspects of the nursing process, such as the care plan, the timing of application, and the interrelation of its steps, these findings highlight the need for a more comprehensive understanding and standardized communication. Nevertheless, it also indicates that nurses have a firm conceptual grasp of the nursing process's fundamental role in providing quality patient care.

These findings align with other studies that have reported varying levels in nurses' knowledge and perceptions regarding the nursing process<sup>4,11</sup>. For

instance, a study conducted by Jamal and Shaheen in Kuwait revealed that participants had satisfactory knowledge and considered the nursing process as a part of their planning during patient care<sup>26</sup>. Similarly, a study conducted in Ethiopia found that the majority of nurses had good knowledge of the nursing process and were confident in its implementation<sup>27</sup>. In another study, most participants (85.1%) had a mean knowledge score of 8.5/10 (1.06); however, they did not effectively implement the nursing process<sup>29</sup>. Conversely, other studies also identified a lack of knowledge as the main barrier to implementing the nursing process<sup>18,29,30</sup>. Overall, these findings reflect the diverse levels of understanding among nurses, highlighting both areas of strength and knowledge gaps that can influence effective implementation.

Moreover, the findings indicate that higher academic qualifications and greater clinical experience were associated with a better understanding of certain aspects of the nursing process. Specifically, academic qualifications influenced knowledge of continuity of care, patient inclusion in care, and recognition of interrelated steps, while clinical experience was associated with understanding the structured framework and care planning. In contrast, professional rank had minimal influence, and other components of knowledge were not significantly associated with qualification or experience. The observed variations in the association between qualification, rank, and experience with nurses' understanding of the nursing process could be attributed to the complexity and multifactorial nature of nursing education and practice. The non-significant associations found in the study may reflect the diverse educational backgrounds and experiences of nurses, suggesting that factors beyond formal qualifications or ranks play a significant role in determining knowledge levels. Additionally, differences in educational systems, training programs, and the evolving nature of nursing practices might contribute to the variability in findings.

Interestingly, various studies in the literature have reported significant associations among nurses' academic qualifications, work experience, and knowledge of the nursing process. For instance, one study involving 101 nurses found substantial associations between work experience ( $\chi^2 = 28.158$ ,  $p < 0.05$ ) and academic qualification ( $\chi^2 = 65.989$ ,  $p < 0.05$ ) with knowledge of the nursing process<sup>28</sup>. Similarly, another study reported that respondents with a nursing education of at least a diploma in nursing had a higher understanding of the nursing process ( $p < 0.01$ )<sup>31</sup>. Furthermore, a study conducted in the Hail region of Saudi Arabia observed a significant association between nurses' knowledge and their use of the nursing process in practice<sup>32</sup>. These findings suggest that, in some contexts, formal education, clinical experience, and institutional support can have a notable impact on nurses' understanding and implementation of the nursing process.

The majority of participants disagreed with the items

related to individual hindrances, suggesting a uniform perception among nurses, regardless of professional rank, experience level, or educational qualifications. The identified individual factors may be perceived similarly by nurses across diverse backgrounds, thereby minimising variation in responses. Additionally, the non-significant associations could indicate that these hindrances are perceived as universal challenges within the nursing profession rather than being influenced by individual characteristics. Despite uniform perceptions of individual hindrances, previous studies have shown that education level and knowledge significantly influence the implementation of the nursing process<sup>14,16</sup>. Other hindering factors, such as workload, the non-availability of resources for required materials, in-service training, and workshops, were also identified<sup>34,35</sup>. Similarly, a study from Saudi Arabia revealed that inadequate time and staffing are the key factors that hinder the implementation of the nursing process<sup>32</sup>. The study also presented the perspectives of the nurses on hospital factors in implementing the nursing process, revealing predominantly non-significant relationships across various items.

The findings showed that most health system-related factors, such as patient-to-nurse ratio, work overload, and resource availability, were not significantly associated with nurses' qualification, rank, or experience. However, lack of periodic training and workshops was related to educational qualification, while experience influenced perceptions of hospital support for the nursing process.

Nurses' perceptions and experiences of professional development reveal essential nuances. About half of the nurses believed that continuous training and workshops in general were not in place. Perceptions of this absence differed by qualification, suggesting that educational level influences how nurses view gaps in broader training opportunities. In contrast, most nurses recognised the availability of formal in-service training programs, which were significantly linked to experience, indicating that more experienced nurses are more likely to be aware of or have access to structured institutional training. Actual participation data show that 56% of nurses received formal training (workshops or in-service) out of 71.42% who received any training. In contrast, others relied on personal study or peer learning, or had no training, highlighting inconsistent access to and uneven implementation of professional development across the nursing staff.

These observations suggest that systemic barriers are largely perceived uniformly across nurses, whereas individual knowledge and experience play a selective role in implementation. In line with some aspects of our findings, a recent study reported no association of experience with any health system-related item<sup>23</sup>. Moreover, evidence from another study indicates that knowledge-related factors have the most significant predictive value (0.35) for nursing process usage, followed by institutional (0.22), professional (0.06),

and attitude-related (0.01) factors<sup>35</sup>, supporting the notion that individual knowledge is a key determinant of practical implementation.

The findings of the present study have important implications for enhancing the implementation of the nursing process in healthcare settings in Saudi Arabia. Addressing factors such as limited participation and access to structured professional development, high workload, and limited resources can improve the quality of nursing care and patient outcomes. Hospital management should prioritize in-service training and professional development programs to ensure that nurses are well-prepared to apply the nursing process effectively. Moreover, the adoption of technology-enhanced systems can further facilitate the implementation of the nursing process by streamlining documentation, enhancing communication, and improving overall efficiency in care delivery. Strengthening organisational support and fostering a professional culture that values and reinforces the nursing process are also essential to ensuring its consistent, evidence-based application across diverse clinical contexts.

While this study provides valuable insights into the barriers of implementing the nursing process, certain limitations should be acknowledged. The cross-sectional design and reliance on self-reported responses may introduce bias. Additionally, the lack of a standardised scoring system to evaluate responses could compromise the objectivity of the findings. Moreover, the study population exhibited a skewed distribution of educational qualifications. Most nurses held a BSc (47.8%) or a Master's degree (40.1%). In comparison, only a small proportion held a Diploma (4.9%) or PhD (7.1%), which may have influenced the overall results and limited the applicability of the findings to nurses with different qualification profiles. Finally, as the study was conducted in a tertiary hospital, the generalizability of the results to other healthcare settings may be restricted.

## CONCLUSION

This study highlights the nurses' knowledge and the multifaceted barriers that hinder the implementation of the nursing process in tertiary healthcare facilities in Saudi Arabia. Overall, the nurses demonstrated variable knowledge, with stronger understanding in certain aspects of the nursing process while gaps remained in others. The identified factors (at the individual and health system levels) not only impede the optimal delivery of patient care but also hinder nurses' ability to engage in best practices fully. While certain individual-level factors, such as nurses' knowledge and education, may support the practice of the nursing process, health system-related factors are also crucial for its effective implementation.

Recognizing and addressing these challenges is critical for enhancing the quality of healthcare services and ensuring the well-being of both patients and healthcare providers. The findings underscore the

need for tailored professional development programs that take into account nurses' academic qualifications and clinical experience, as these factors shape their understanding of the nursing process. Furthermore, improving awareness of and access to structured in-service training and workshops can reduce inconsistencies in professional development and promote a more uniform application of the nursing process across all nursing staff. By prioritising both individual-level knowledge development and systemic support, healthcare organisations can strengthen nursing competence, optimise patient care, and ultimately ensure safer, higher-quality healthcare delivery.

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Informed consent was obtained from each selected nurse. Confidentiality and anonymity were strictly maintained throughout the study. Nurse participation in the study was voluntary, and they could withdraw at any time.

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#### AUTHOR CONTRIBUTION

Tayyib NAG: Conceived and designed the study, conducted research, provided research materials, and collected and organized data, analyzed and interpreted data.

Alsolami FJ: Conceived and designed the study, conducted research, provided research materials, and collected and organized data. wrote the initial and final draft of the article and provided logistical support.

All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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