Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

Implementation of Nursing Process Program and Assessment Factors Affecting Nurses' Knowledge and Performance

Eman Sobhy Elsaid Hussein

Lecturer in Medical-Surgical Nursing, Faculty of Nursing, Ain Shams University, Egypt

Asst. Prof. in College of Applied Medical Sciences in Yanbu, Taibah University, KSA

Abstract: **The nursing process is cyclical and dynamic, interpersonal and collaborative, and universally applicable. Nurses use the nursing process as a nursing care plan through healthcare providers to achieve the best outcomes and improve patient quality management.**

Objective: **This study aimed to implement a nursing process program and assess factors affecting nurses' knowledge and performance.**

Methods: **The pre-experimental design was applied in the current study. The study was conducted at Yanbu General Hospital in the Nursing Continuing Education department. The studied nurses, a total of 173, participating in this study were selected by a simple random sampling technique. Five tools were used for data collection: a demographic questionnaire, Likert scale for measuring nurses' attitudes toward the nursing process implementation, checklist to measure nurses' performance, questionnaire for nurse's knowledge about the nursing process, and questionnaire to assess the factors affecting the implementation of the nursing process.**

Results: **There were highly statistically significant differences between pre-/post-program of the nursing process regarding the total score of nurses' knowledges. A total of 97.7% had a satisfactory level in the post-program, while 72.3% had an unsatisfactory level in the pre-program. Regarding total scores for nurses' performance, 76.9% had good competence in the post-program, while 67.6% had poor competence in the pre-program (P <0.01). The majority of studied nurses exhibited positive attitudes post-program. Insufficient time, no nurse/patient ratio, and no feedback available were factors affecting the implementation of the nursing process.**

Conclusion: **There was a highly statistically significant difference between pre- and post-program in regard to nurses' attitudes, knowledge, and performance.**

Keywords: **Implementation, Performance, Factors, Knowledge, Nursing Process.**

I. INTRODUCTION

Nursing is an active and interpersonal problem-solving process. The nursing process is a systematic, rational method of planning, problem-solving approach, and decision-making [1]. It helps to assess patients' health status and needs to determine actual or potential health problems and give specific nursing interventions to meet those needs. The patient may be an individual, a family, a community, or a group [2].

The nursing process is a standardized applicable characteristic used as a framework for nursing care plans in all healthcare settings with patients of all age groups [3]. Standards of nursing practice include six phases of the nursing process: assessment, diagnosis, outcome identification, planning, implementation, and evaluation [2].

The assessment-based nursing intervention improves the life quality of patients [4] by the organization, validation, and documentation of data. It depends on the accurate and complete collection of data through all phases of the nursing process to evaluate outcomes achievement [5, 6].

The database is complete information about the patient, including health history and basic physical assessment [7]. Data include subjective or objective and constant or variable types, and can be from a primary or secondary source [8].

The North American Nursing Diagnosis Association (NANDA) defines diagnoses as labels and the patient problem statement as the diagnosis plus etiology and the causal relationship between a problem and its related or risk factors. The nursing diagnosis refers to the actuality or the potentiality of the problems/syndrome with a categorization of the diagnosis as health promotion [9, 10].

Planning is a systematic phase of the nursing process that involves decision making and problem-solving. The nurse shows the patient's assessment data and diagnostic statements for direction in formulating the patient's goal and designing the nursing intervention required to prevent, reduce, or eliminate the patient's health problems [11].

A standardized nursing care plan is a written or computerized guide that categorizes information about the patient's care [12]. The most obvious benefit of a formal written care plan is that it provides for continuity of care and evaluation of the efficiency of the nursing care plan applied with the use of the NANDA guidelines [13].

Implementing the interventions is using priorities of problems or needs to improve outcomes through categorizing interventions based on nursing goals [14]. Implementation is the action phase in which the nurse performs the nursing interventions. The fifth standard of the American Nurses Association's standards of practice is implementation [15]. Three of the implementation substandards apply to all registered nurses; coordination of care, health teaching and health promotion, and consultation using prescriptions and treatment apply only to advance practice nursing [2].

Implementing electronic health records is the action phase [16] and important to the nursing care plan's success, so the nurse needs cognitive, interpersonal, and technical skills to develop nursing interventions during the planning stage. During the implementation of the nursing care plan, the nurse persistently assesses the patient and his or her response to nursing care with feedback on the patient's condition, problems, and response changes, and determines when reordering of priorities is required [11].

Evaluation is a process of appraisal which decides the patient's progress based on goals/outcomes achieved and the effectiveness of the nursing care plan [17]. Evaluation is an important aspect of the nursing process because the conclusions drawn from the evaluation determine whether the nursing interventions terminate, continue, or change. Evaluation is the sixth standard of the ANA standards of practice [18].

The factors that affect implementing the nursing process in the clinical practice include manpower and the use of electronic or manual tools [19]. Nursing care plans are an important part of providing safe and quality patient care [20] and defining the nurses' responsibility toward the patient's treatment, providing consistency of care and allowing the nursing team to customize its interventions for each patient [21]. A standardized nursing language improves understanding and communication, as well as increasing nursing knowledge and enhancing nursing education [2].

The plan represents nursing knowledge, expertise, and actions required to ensure that the patient receives safe, competent, compassionate, and ethical care. Where the purpose of a plan is to maximize health outcomes by ensuring the patient's needs in a manner that promotes the consistent application of care, the plan's functions are threefold [22]. Nurses think critically and use an interpretative process to develop, maintain and evaluate the patient's responses to interventions/plan of care and make nursing care decisions [23].

Significance & justification

The nursing process in health institutions at Yanbu General Hospital is improperly implemented. There are some factors that serve as barriers to the implementation of the nursing process, thus preventing quality care. For the proper application of the nursing process program, nursing staff needs to know how to write a correct nursing care plan and then assess factors affecting the plan.

Aim of the study

This study aimed to implement a nursing process program and assess factors affecting nurses' knowledge and performance in Yanbu General Hospital.

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

Research Questions

- What is the level of nurses' knowledge toward the nursing process pre- and post-program?
- What is the difference between the nurse's performance pre- and post-program?
- What is the nurses' attitude towards implementing the nursing process?
- What are the factors affecting the implementation of the nursing process among nurses?
- What are the correlations between the demographic and total score for nurses' performance and knowledge pre/post-program?

II. MATERIALS AND METHODS

Research Design

The pre-experimental design was used to achieve the aims of the study. The one-group Pretest- post-test design provides a comparison and measure change occurring due to interventions between a group of participant nurses before and after the experimental intervention.

Setting

The study was conducted at Yanbu General Hospital in the Continuing Nursing Education department, which included 350 beds. It is located in Yanbu City, Al-Madinah Al Munawarah, Kingdom of Saudi Arabia.

Subjects

The study included nurses in quantitative and qualitative designs. The qualitative data was collected from nine head nurses and the quantitative data was collected from 164 nurses selected by a simple random sampling technique from the hospital, proportional to its sample size. The total number of nurses in the hospital was 500 (Saudi and non-Saudi).

Tools for data collection

The data were collected using the following tools:

1- The demographic questionnaire developed by the researcher, including eight questions about demographic characteristics for nurses, such as sex, age, educational level, years of experience, institutional/educational awards, name of the department, the position of nurses and nationality.

2- The nurse's knowledge questionnaire regarding the nursing process. It was developed by the researcher based on the related literature [24]. It was completed pre- /post-program. It included 30 questions in true-false, MCQs, and matching formats regarding the nursing process (assessment, outcome/goals, diagnosis, planning, implementation, and evaluation), a score of one was given for correct answer and a zero for incorrect answer. For each part, the scores of the items were summed up and a total score of 30 degrees, with 50% as more than satisfactory, while less than 50% as unsatisfactory, and the reliability test by Cronbach's alpha test was (0.81) for the nurse's knowledge questionnaire.

3- Nurse's performance checklist, to measure nurses' performance during the implementation of the nursing process. It was developed by the researcher based on the related literature [24] and included the six parts of the nursing process. The assessment included 12 steps for history and physical examination, nursing diagnosis (six steps), desired outcome (seven steps), planning (ten steps), implantation (nine steps) and evaluation (six steps), which were indicated by *done* (performed) give score two degree, *not done* (not performed) give score one degree, and *NA* (not applicable) give score zero degree. It was administered pre-/post-program and the scoring system was divided into three sections, each one-third of the total score for subcategories of good, satisfactory and poor competence. The total scoring was 128 points divided into the same: Good competence = 85 to 128, Satisfactory competence = 43 to 84 and Poor competence = 0 to 42. The reliability test by Cronbach's alpha test was (0.79) for nurse's performance checklist.

4- A Likert scale was used to measure nurses' attitudes toward the nursing process implementation. It included 20 questions evaluated by a five-point scale: strongly agree, agree, I do not know, disagree, strongly disagree. The scale was adapted from [25]. Scoring system: code from 1 to 5 respectively, the total score of 50 points, defined as the following: less than or equal 50% negative attitude while over 50% positive attitude. This was done pre /post-program.

5- A questionnaire to assess factors affecting the implementation of the nursing process. It was adopted from [25] and included 10 questions to be answered by yes or no; it was applied post-program only.

Study process

The researcher received approval from the dean of faculty and the Continuing Nursing Education department to prepare the classroom for a PowerPoint presentation and prepare the course using clinical scenarios with different diseases in which to apply the nursing process. The studied nurses registered from 7:30 am to 8:00 am before the program started and completed the demographic data and pre-test for nurse's knowledge regarding the nursing process within 30 minutes. The researcher used a two-hour PowerPoint presentation along with a lecture about the nursing process. Subsequently, a post-test for nurse's knowledge related to the nursing process was administered within 20 minutes after the presentation. Then there was a 30-minute break.

Then the researcher applied different clinical scenarios to ensure the correct application of the nursing care plan in practice through a workshop in a different specialty (medical, critical, surgical, maternal, emergency and pediatric), after a program of 50 to 160 minutes. Participants were offered the clinical scenarios according to the questionnaire of nursing performance, and then classified the results as satisfactory or unsatisfactory. The Likert scale for nurses' attitudes toward the nursing process was administered during the program orientation and again at the end of the workshop within 10 minutes. The questionnaire about factors affecting the implementation of the nursing process among nurses was completed at the end of the program.

The program was carried out over 12 weeks, Monday and Thursday of every week from 7:30 am to 12:30 pm, from October to December 2017. Registration and orientation were from 7:30 to 8 am. Sessions started at 8 am and continued until 10 am and after that, the workshop was conducted from 10:30 to 12:30.

The program (post-program) was evaluated from January to November 2018 for practices using some clinical cases from their departments by a nurse performance questionnaire during the implementation nursing process as clinical scenarios. The confidentiality and anonymity of the nurses' data were ascertained.

Pilot study:

The researcher drafted the tools of this study in a structured format and it used them in a pilot test before applying them to the respondents enrolled in this study. Refinements and modifications were made based on pretest results. The questionnaires received expert validation by nine experts from educational staff in medical-surgical nursing.

Limitation of the study

The program started with 253 studied nurses and several of them withdrew because of working conditions at night or leaving on annual holidays, so the program was completed with 173 studied nurses at Yanbu General Hospital.

Ethics Approval and Consent to Participate

To carry out the study, the researcher got the official approval from the director of Yanbu General Hospital and the Nursing Continuing Education Department and ethical approval from the Ethical Committee and Dean of Faculty Applied Medical Sciences, Taibah University Yanbu Female Campus, Kingdom of Saudi Arabia.

Data Analysis

The collected data were analyzed using SPSS version 22. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were used to present the sociodemographic data of participants. The paired sample t-test was employed to determine the difference between subjects before and after the program at $P < 0.05$.

III. RESULTS

1- Demographic characteristics for the studied nurses

The current study showed that the majority of studied nurses (93.6%) were female and for both sexes, more than three-quarter (75.7%) were aged 21 to 30. All had graduated from government educational institutions. Less than two-thirds of them (64.7%) had one to four years of experience. Regarding their nationality, more than half of them (59%) were Saudi, and the majority of them (92.5%) were staff nurses (Table **1**).

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

The distribution of studied nurses in the departments in the hospital showed equal percentages in NICU, OPD, and dialysis of 2.9%, while surgical, Ob-Gyn, ICU, medical, pediatric, OR, and ER wards were 22%, 17.3%, 15%, 13.3%, 9.2%, 8.7%, and 5.8%, respectively (Figure **1**). Regarding educational levels for studied nurses, less than two-thirds (64.2%) were diploma and one-third (32.2%) were baccalaureate, while none had Ph.Ds. (Figure **2**).

Table 1. Demographic data for nurses undergoing the study.

Items		Number Total= 173	Percentage (%)
Sex:	▪ Female	162	93.6
	▪ Male	11	6.4
Age:	▪ ≤ 20 y	0.0	0.0
	▪ 21 to 30	131	75.7
	▪ 31 to 40	36	20.8
	▪ 41 to 50	2	1.2
	▪ ≥ 51 years	4	2.3
Years of experience:			
	▪ 1 – 4	112	64.7
	▪ 5 -9	43	24.9
	▪ 10 – 14	10	5.8
	▪ 15 -19	3	1.7
	▪ 20 – 24	1	0.6
	▪ ≥ 25	4	2.3
Institutional (educational award):			
	▪ Government	131	75.7
	▪ Private	4	24.3
The position of the nurse:			
	▪ Nurse officer	4	2.3
	▪ Head nurse	9	5.2
	▪ Staff nurse	160	92.5
Nationality	▪ Saudi	102	59
	▪ Non- Saudi	71	41

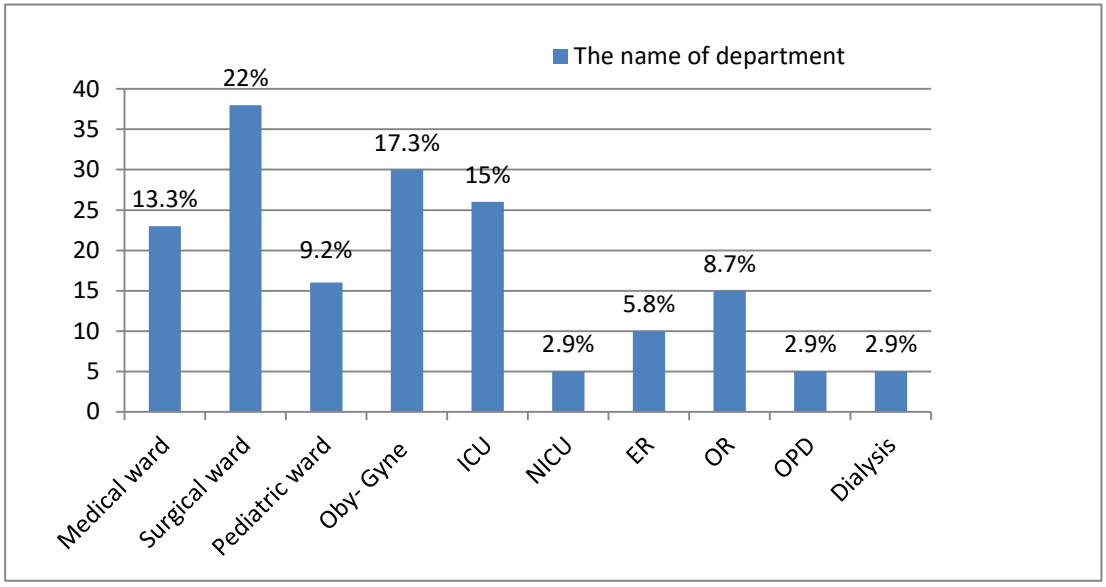

Figure 1. Distribution of studied nurses in the departments.

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

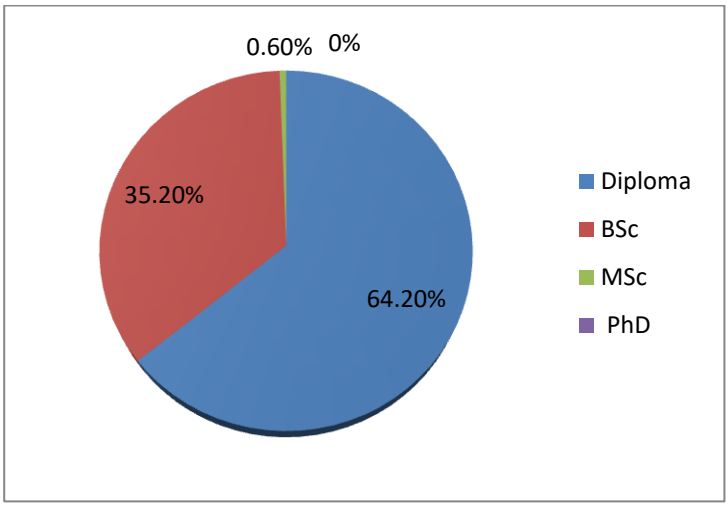

Figure 2. Education level for studied nurses.

2- Nurse's knowledge questionnaire regarding the nursing process

In a comparison of studied nurses' knowledge about the nursing process pre- and post-program, post-program, the majority (97.1%) of studied nurses had a satisfactory level regarding evaluation, and more than two-thirds (76.9, 72.3, 80.3, 68.2%) for assessment, goal/outcome, planning, and implementation, respectively. There was a highly statistically significant difference between pre- and post-program regarding studied nurses' knowledge about the nursing process (Table **2**).

There was a highly statistically significant difference between pre- and post-program in studied nurses regarding the total score for nurses' knowledge about the nursing process (P <0.01). The majority of them (97.7%) had a satisfactory level in the post-program, while (72.3%) had an unsatisfactory level in the pre-program (Figure **3**).

Table 2. Comparison of studied nurse's knowledge about the nursing process pre and post-program.

Item	Pre-program (n=173)		Post-program (n=173)		t-test	P value	Significance
	No.	*%*	*No.*	*%*			
Nursing assessment:							
Satisfactory	116	67.1	133	76.9			Highly
Unsatisfactory	57	32.8	40	23.1	3.69	<0.01	Significant
Nursing diagnosis:							
Satisfactory	22	12.7	92	53.2			Highly
Unsatisfactory	151	87.3	81	46.8	10.15	<0.01	Significant
Goal / Outcome:							
Satisfactory	20	11.6	125	72.3			Highly
Unsatisfactory	153	88.4	48	27.7	15.4	<0.01	Significant
Nursing planning:							
Satisfactory	53	30.6	139	80.3			Highly
Unsatisfactory	120	69.4	34	19.7	7.65	<0.01	Significant
Nursing implantation:							
Satisfactory	26	15.0	118	68.2			Highly
Unsatisfactory	147	85.0	55	31.8	13.33	<0.01	Significant
Evaluation							
Satisfactory	62	36.4	168	97.1			Highly
Unsatisfactory	110	63.6	5	2.9	8.74	<0.01	Significant

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

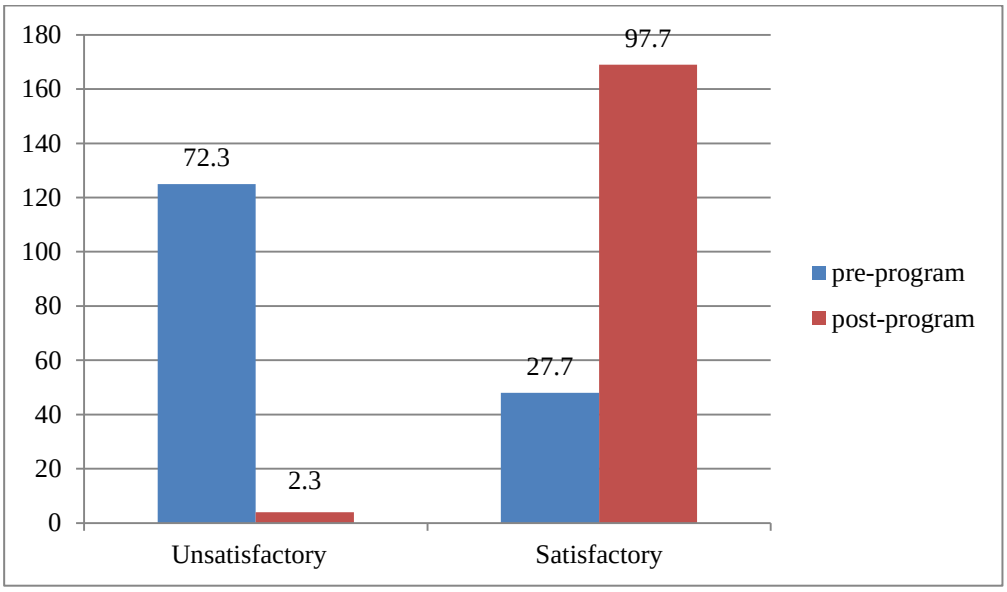

Figure 3. Total score of nurse's knowledges regarding nursing process pre/post-program.

3- Nurse's performance checklist regarding the nursing process

There were highly statistically significant differences between studied nurse's performance in the nursing process pre- and post-program; post-program, the highest percentage (83.8%) of studied nurses had good competence in assessing a patient's health/illness status, and more than half (54.3%) had good competence in the nursing diagnosis, while more than two-thirds (74.6, 75.7, 78, 78.6%) of them had good competence related to goal/outcome, planning, implantation, and evaluation, respectively (Table **3**).

There was a highly statistically significant difference between pre- and post-program in studied nurses regarding total scores on nurses' performance in the nursing process. More than three-quarters of them (76.9%) had good competence in the post-program, while 67.6% had poor competence in the pre-program (P <0.01) (Figure **4**).

Table 3. Comparison of nurse's performance towards the nursing process pre/post program.

Items	Pre-program		Post-program		t-test	P value	Sig.
	No=173	*%*	*No=173*	*%*			
Assessment of patient's Health / Illness Status							
▪ Good competence	33	19.1	145	83.8			
▪ Satisfy competence	34	19.7	27	15.6			Highly
▪ Poor competence	106	61.3	1	0.6	58.64	<0.01	Significant
Diagnosis							
▪ Good competence	10	5.8	94	54.3			
▪ Satisfy competence	59	34.1	66	38.2			Highly
▪ Poor competence	104	60.1	13	7.5	14.16	<0.01	Significant
Goals/outcomes							
▪ Good competence	4	2.3	129	74.6			
▪ Satisfy competence	86	49.7	34	19.7			Highly
▪ Poor competence	83	48.0	10	5.8	21.91	<0.01	Significant
Planning							
▪ Good competence	15	8.7	131	75.7			
▪ Satisfy competence	29	16.8	27	15.7			Highly
▪ Poor competence	129	74.6	15	8.7	23.72	<0.01	Significant

Implantation							
▪ Good competence	9	3.2	135	78.0			
▪ Satisfy competence	27	15.6	30	17.4			Highly
▪ Poor competence	137	79.2	8	4.6	25.79	<0.01	Significant
Evaluation							
▪ Good competence	26	15.0	136	78.6			
▪ Satisfy competence	33	20.2	30	17.4			Highly
▪ Poor competence	112	64.7	7	4.0	16.86	<0.01	Significant

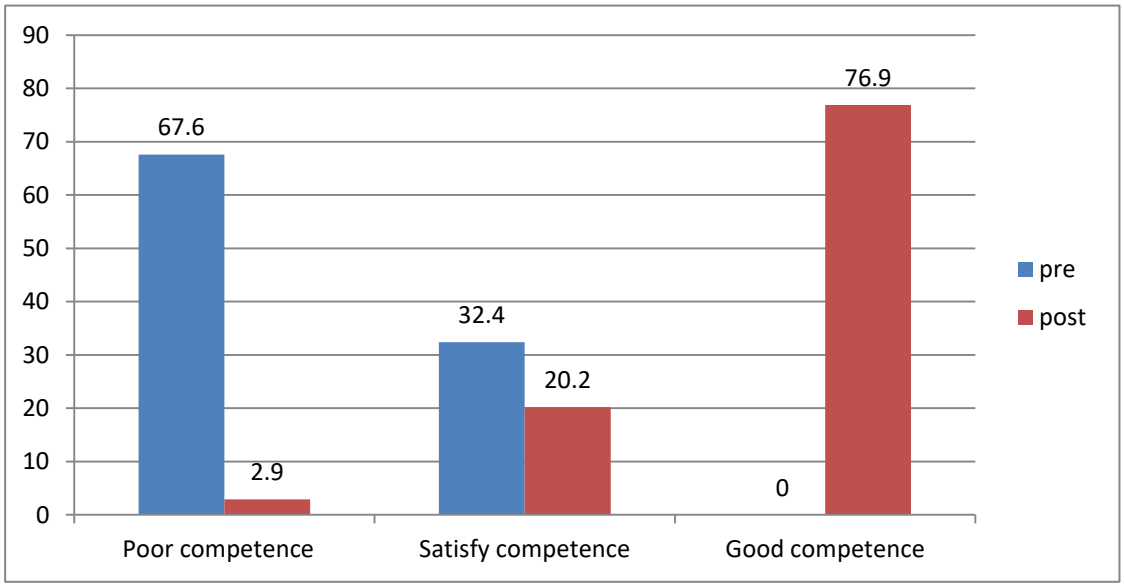

Figure 4. Total score of nurse's performances towards the nursing process pre/post-program.

4- Likert scale for measuring nurses' attitudes toward the nursing process implementation

There was a highly statistically significant difference between pre- and post-program regarding nurses' attitudes toward the nursing process. The majority (95.4%) exhibited positive attitudes post-program (Figure **5**).

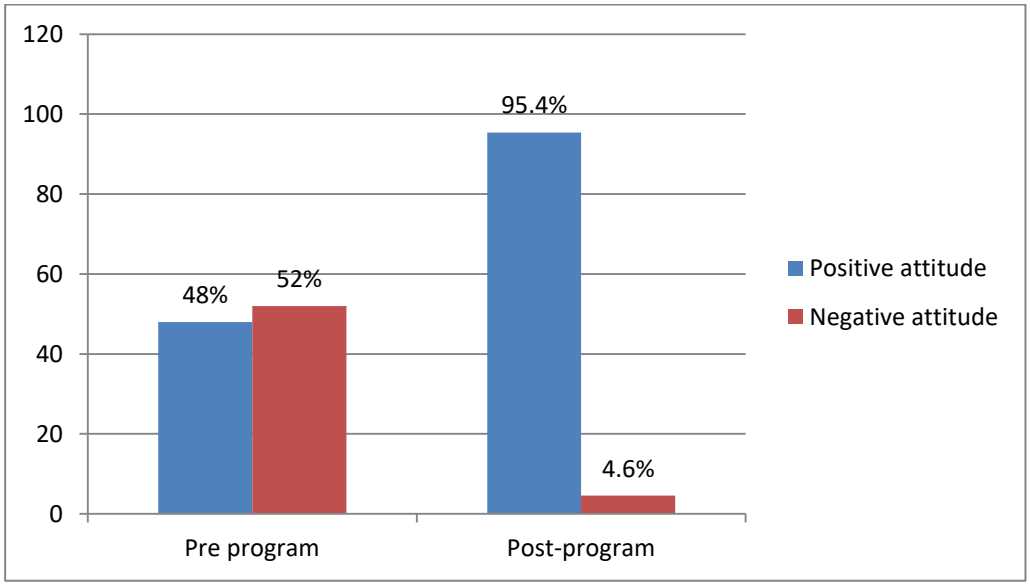

Figure 5. Total score of nurses' attitudes towards the nursing process pre/post program (number= 173).

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (341-355), Month: May - August 2020, Available at: www.noveltyjournals.com

5- Questionnaire to assess factors affecting the implementation of the nursing process

Post-program, more than three-quarters (77.5%) of nurses agreed that hospital administration supported the application of the nursing care plan, while more than half (53.2, 57.2, 51.4%) of the studied nurses said indicated insufficient time, no nurse/patient ratio, and no feedback available, respectively. Regarding educational levels, 82.7% have adequate education and training to apply the nursing process in Table 4.

Table 4. Factors affecting the implementation of the nursing process post-program (number= 173).

	Item	Yes		No	
		N	%	N	%
1	Does the hospital administration support the application of NP?	134	77.5	39	22.5
2	Is the allocation of resources for the application of NP adequate?	96	55.5	77	44.5
3	Is allocated insufficient time to apply the nursing process?	81	46.8	92	53.2
4	Is the nurse/patient ratio optimal to apply the nursing process?	74	42.8	99	57.2
5	Is appreciating feedback available for the application of NP?	84	48.6	89	51.4
6	Are there monitoring and evaluation for the application of NP?	101	58.4	72	41.6
7	Are the salary and promotion motivating for the application of NP?	57	32.9	116	67.1
8	Have you ever seen other nurses applying the NP?	112	64.7	61	35.3
9	Have you got on the job training on the nursing process?	106	61.3	67	38.7
10	Is your educational level adequate to apply NP?	143	82.7	30	17.3

Table 5. Correlations between demographic data and total score for nurses' performance and knowledge pre/ post-program.

Items	Sex	Age	Education level	Years of experience	Institutions	Department of work	Position of the nurses
Total score for nurses' performance Pre-program	r= -0.202 p 0.004 HS	r= 0.154 p 0.022 S	r= 0.330 p 0.000 HS	r=0.212 p 0.003 HS	r= 0.102 p 0.090 NS	r= .028 p 0.358 NS	r= 0.080 p 0.148 NS
Total score for nurses' performance post-program	r= -0.288 p 0.000 HS	r= 0.253 p 0.000 HS	r= 0.568 p 0.000 HS	r=.303 p 0.000 HS	r= 0.175 p 0.011 S	r= 0.071 p 0.177 NS	r= -0.067 p 0.191 NS
Total score for nurses' knowledge Pre-program	r= .189 p 0.006 HS	r= 0.057 p 0.227 NS	r= -0.012 p 0.436 NS	r=-0.031 p 0.342 NS	r= .042 p 0.292 NS	r= 0.039 p 0.304 NS	r= 0.018 p 0.407 NS
Total score for nurses' knowledge post-program	r= -0.026- p 0.367 NS	r= 0.084 p 0.137 NS	r= 0.226 p 0.001 HS	r= 0.160 p 0.018 S	r= - 0.110 p 0.075 NS	r= 0.087 p 0.128 NS	r= -0.061 p 0.213 NS

There was a highly statistically significant correlation between the demographic and total score for nurses' performance and knowledge pre-/post-program (highly significant at P<0.01 and significant at P<0.5), as shown in Table **5.**

IV. DISCUSSION

The nursing process is a framework used to give effective, coordinated, and organized quality care for patients. It supports evidence-based practice. The results of the current study illustrate that 93.6% of the studied nurses were female and 75.7% for both sexes their ages were from 21 to 30 years old; this finding corresponds with a previous study [26] which reported that, more than half of the study female students and more than half of the students' ages ranged between 20–22 years.

The results of the current study illustrate that over two-thirds of study subjects were from the government and they have one to four years' experience. This finding was in agreement with previous studies [27], which mentioned that the government has implemented supply side reforms in health care, Nurses with less than ten years of experience had the most positive perceptions.

The results of the current study showed that the majority of the studied subjects were staff nurses and more than half of them were of Saudi nationality. This finding agreed with [28] "a cross-sectional study in Saudi Arabia" that all sampled staff nurses contribute to nurses' evidence-based practice implementation.

Regarding the educational level of studied nurses, less than two-thirds were diploma and one-third were baccalaureate degree. None had Ph.Ds. This finding corresponds with a study [29], which confirmed the educational level of nurses with BSc. Those with degrees were 6.9% more likely to implement the nursing process than those with diplomas.

The results of the current study showed that in the studied nurses' knowledge about the nursing process in post-program, the majority of studied nurses had a satisfactory level in evaluation, and more than two-thirds of them rated satisfactory for assessment, goal/outcome, planning, and implementation, and there were highly statistically significant differences between pre- and post-program regarding the studied nurses' knowledge about the nursing process. This finding did not correspond with a study [30], which reported that the nursing process was poorly implemented in the Afar region mainly for the lack of knowledge and absence of in-service training, while at the same time [29] confirming that the majority of the participants were not implementing the nursing process correctly. Many factors hinder them from applying the nursing process, including levels of education, knowledge, and skill of nurses.

The results of the present study indicated a highly statistically significant difference between pre- and post-program in studied nurses regarding total scores of nurses' knowledge about the nursing process. The majority of subjects had a satisfactory level in the post-program, while more than two-thirds of them had an unsatisfactory level in the pre-program. This finding supported another study [28], which reported satisfaction regarding knowledge and attitudes concerning implementing the nursing process.

The current study revealed that there was a highly statistically significant difference between pre- and post-program regarding nurse's performance related to the assessment of a patient's health/illness status. A slight majority of studied nurses had good competence post-program. This finding supported a study [31], which reported that despite differences in assessment protocols and assessment form formats among the organizations, comprehensiveness of assessment documentation provided better support for nurses to plan for meeting extensive resident care needs. This improvement might be attributed to better structure and improved access. The findings also agreed with a study's results [32] that a statistically significant correlation exists between clinical nursing information system and nurse performance, in particular, a Professional Assessment Instrument.

The results showed that more than half of studied nurses had good competence and one-third of them had satisfactory competence post-program, while over two-thirds of them had poor competence related to nursing diagnoses per NANDA International. This finding agreed with a report [33] that participants were knowledgeable of the nursing process and held a relatively positive attitude toward the nursing process and nursing diagnosis. Along the same lines, another study [34] reported that professional practice standards and entry-level practice competencies were needed for nurses.

Regarding goal/outcome, planning, implementation, and evaluation post-program, the results showed that two-thirds of studied nurses had good competence. This finding corresponded with other studies' [35, 36]'s evidence that education significantly improved the quality of the nursing process "nursing diagnoses, interventions, outcomes."

Regarding, the total score of nurses' performance in the nursing process, the results of this study showed that more than three-quarters of studied nurses had good competence post-program, while two-thirds had poor competence pre-program. There was a highly statistically significant difference between pre- and post-program, in agreement with a report [37] that the efficacy subscale of burnout was positively related to job satisfaction at the individual level, and the organizational level was associated with higher job satisfaction. At the same time another study [38] revealed a highly statistically significant difference between pre- and post-intervention hours worked and individual levels of emotional exhaustion associated with job satisfaction.

The results of the current study show that there was a highly statistically significant difference between pre- and post-program regarding nurses' attitudes toward the nursing process. The majority showed a positive attitude post-program. This finding corresponded with previous research [39, 40], which reported that evaluations of nurses' attitudes toward the nursing process using the Dayton attitude scale revealed that participants were knowledgeable of the nursing process and held positive attitudes; [41] a study reported that half of the nurses had a positive attitude toward utilizing the nursing process, and another study [33] reported that higher nursing degrees were associated with more positive attitudes. Moreover, previous research [1, 25] reported that most of the study participants had a positive attitude toward the nursing process.

In the current study, the researchers observed that many factors affected the implementation of the nursing process among nurses post-program. These general factors included individuals' organization or institution and level of education. This institution is under the Ministry of Health System, with Quality Management System developing a nursing care plan in the hospital with added nursing informatics (alert) including nursing practices without the nursing process.

Regarding hospital administration support for the application of the nursing care plan, more than three-quarters of nurses agree that the hospital administration shows support, while more than half of studied nurses mention insufficient time, no nurse/patient ratio, and no feedback available, but they did agree that resources available for the application of NP are adequate, as monitoring and evaluation for the application of NP. This finding agrees with a study [42], which reported that the most important management barriers were the lack of time for the nursing process because of an excessive number of patients, disagreed with "lack of authorities" support for implementing the nursing process and submitting non-nursing duties to the nurses."

Regarding educational level, the majority of studied nurses agreed with a high adequate level, and two-thirds of them said there is no salary increase or promotion serving as motivating for the application of NP, while other nurses applying the NP got on-the-job training on the nursing process. This finding disagrees with previous research [42, 43], which reported that the most important individual barriers from the perspective of nurses were the lack of sufficient information about the concept of the nursing process, the lack of belief in doing the patient care according to the nursing process, and insufficient learning about the nursing process in intensive care units.

This finding corresponds with a study [6], which reported that time-consuming shift reports, time-saving in making care plans, undesirable content design, and paperwork-oriented/not patient-centered are all problems modern healthcare facilities face. The finding also agrees with another study [44], which reported that the institutional factor ranks as the second-highest predictive value in using the nursing process, but many institutions do not use the nursing process for the care of their clients. Moreover, implementing the nursing process in both government and private health institutions is one of the problems currently facing the nursing profession in Nigeria [45].

In the same line, a study [29] reported that most studied nurses commented on the lack of education level, knowledge, practice, and the atmosphere of the workplace, and shortage of materials and supplies to use the nursing process factors that affect implementing the nursing process properly [46].

The current study found a highly statistically significant correlation between the demographic and total score for nurses' performance and knowledge in pre-/post-program. This finding agrees with a study [32], which reported that a statistically significant correlation was observed both between the observed time and the level of illness severity and between time and functional models.

It is the researcher's opinion that the effective implementation of the nursing process in a framework leads to improved quality of care and decreases potential complications, hospital length of stay, and the cost of care, so the researcher advises continuous program education especially for new staff, and the use of advanced new technology in in-service nursing informatics. In the same vein, a study [19] reported the development and application of electronic software in the NP and factors affecting the implementation of the NP. Moreover, previous research [45, 47] reported that it has fostered increased awareness in the use of the nursing process through seminars and workshops.

In another view on the new trend toward training and education for nursing staff on an alert system by inserting standardized nursing care plan to check only on the main point, especially with patient diagnoses and nursing diagnoses, this agrees with a study [48], which reported that both standardized and individualized care plans should be created and stored by computer [49].

V. CONCLUSION

There was a highly statistically significant difference between pre- and post-program regarding nurses' attitudes toward the nursing process; the majority exhibited positive attitudes post-program, as well as regarding the studied nurse's knowledge and performance about the nursing process. Ten factors affected the implementation of the nursing care plan.

VI. RECOMMENDATIONS

The current study recommends: Further studies to assess factors influencing the prevalence and accuracy of the nursing process in clinical practices; continuous education in-services for nursing, especially new staff, as a workshop and seminar; insert a standardized nursing care plan on an alert system to facilities for nursing intervention; educational programs for nurses about new technology using the nursing informatics based nursing process.

LIST OF ABBREVIATIONS:

NP	Nursing process
ANA	American Nurses Association
NA	Not applicable
NANDA	North American Nursing Diagnosis Association

CONFLICT OF INTEREST

The author has declared no conflict of interest(s).

FUNDING SOURCES

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ACKNOWLEDGMENTS

The authors would like to acknowledge the staff of the Nursing Continuing Education Department in Yanbu General Hospital and all nurses, nursing managers and management groups and organizations for giving the research team support, which supported the researchers in data collection but these groups were not involved in the study design, analysis, and interpretation of data and writing of the manuscript.

REFERENCES

[1] Almeida BP, Dias FSB, Cantu PM, Duran ECM, Carmona EV. Attitudes of nurses from a public teaching hospital regarding the nursing process. Rev Esc Enferm USP. 2019;53:e03483.

[2] American Nurses Association A. Nursing: Scope and Standards of Practice. 3rd ed. Silver Spring, Maryland 2015.

[3] Goncalves PDB, Sampaio FMC, Sequeira CAC, Paiva ESM. Data, diagnoses, and interventions addressing the nursing focus "delusion": A scoping review. Perspect Psychiatr Care. 2020;56(1):175-87.

[4] Zhang Y, Xia X, Zhuang X. Effect of quantitative assessment-based nursing intervention on the bowel function and life quality of patients with neurogenic bowel dysfunction after spinal cord injury. Journal of clinical nursing. 2018;27(5-6):e1146-e51.

[5] Lorini C, Porchia BR, Pieralli F, Bonaccorsi G. Process, structural, and outcome quality indicators of nutritional care in nursing homes: a systematic review. BMC Health Serv Res. 2018;18(1):43.

[6] Lee TT, Chang PC. Standardized care plans: experiences of nurses in Taiwan. Journal of clinical nursing. 2004;13(1):33-40.

[7] Egilsdottir HO, Byermoen KR, Moen A, Eide H. Revitalizing physical assessment in undergraduate nursing education - what skills are important to learn, and how are these skills applied during clinical rotation? A cohort study. BMC nursing. 2019;18:41.

[8] Rabelo-Silva ER, Dantas Cavalcanti AC, Ramos Goulart Caldas MC, Lucena AF, Almeida MA, Linch GF, et al. Advanced Nursing Process quality: Comparing the International Classification for Nursing Practice (ICNP) with the NANDA-International (NANDA-I) and Nursing Interventions Classification (NIC). Journal of clinical nursing. 2017;26(3-4):379-87.

[9] Paans W, Nieweg, Roos MB, Schans CPvd, Sermeus W. What factors influence the prevalence and accuracy of nursing diagnoses documentation in clinical practice? A systematic literature review. Journal of clinical nursing. 2011;20:2386-403.

[10] Herdman TH, Kamitsuru S. NANDA International: Nursing Diagnoses Definitions and Classification 2018-2020. 7th ed. Edition t, editor. New York • Stuttgart • Delhi • Rio de Janeiro: Thiem; 2018.

[11] Butcher HKB, Gloria M. Dochterman, Joanne M. McCloskey. Wagner, Cheryl. Nursing Interventions Classification (NIC). 7 ed: St. Louis, MO: Mosby Elsevier; 2018.

[12] Garrison E, Beverage J. Implementing a Process to Measure Return on Investment for Nursing Professional Development. J Nurses Prof Dev. 2018;34(1):8-11.

[13] Gencbas D, Bebis H, Cicek H. Evaluation of the Efficiency of the Nursing Care Plan Applied Using NANDA, NOC, and NIC Linkages to Elderly Women with Incontinence Living in a Nursing Home: A Randomized Controlled Study. Int J Nurs Knowl. 2018;29(4):217-26.

[14] Huckfeldt PJ, Kane RL, Yang Z, Engstrom G, Tappen R, Rojido C, et al. Degree of Implementation of the Interventions to Reduce Acute Care Transfers (INTERACT) Quality Improvement Program Associated with Number of Hospitalizations. J Am Geriatr Soc. 2018;66(9):1830-7.

[15] Mendu ML, Michaelidis CI, Chu MC, Sahota J, Hauser L, Fay E, et al. Implementation of a skilled nursing facility readmission review process. BMJ Open Qual. 2018;7(3):e000245.

[16] Da Costa C, Linch G. Implementation of Electronic Records Related to Nursing Diagnoses. Int J Nurs Knowl. 2020;31(1):50-8.

[17] Anrys P, Strauven G, Roussel S, Vande Ginste M, De Lepeleire J, Foulon V, et al. Process evaluation of a complex intervention to optimize quality of prescribing in nursing homes (COME-ON study). Implement Sci. 2019;14(1):104.

[18] Alfaro-LeFevre R. Applying nursing process: the foundation for clinical reasoning 8ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2014.

[19] Lotfi M, Zamanzadeh V, Valizadeh L, Khajehgoodari M, Ebrahimpour Rezaei M, Khalilzad MA. The implementation of the nursing process in lower-income countries: An integrative review. Nurs Open. 2020;7(1):42-57.

[20] Sepahvand F, Mohammadipour F, Parvizy S, Zagheri Tafreshi M, Skerrett V, Atashzadeh-Shoorideh F. Improving Nurses' Organizational Commitment by Participating in their Performance Appraisal Process. J Nurs Manag. 2020.

[21] Mas Pons R, Escriba Aguir V. [The Spanish version of the "Nursing Stress Scale". A cross-cultural adaptation process]. Rev Esp Salud Publica. 1998;72(6):529-38.

[22] Gilissen J, Pivodic L, Wendrich-van Dael A, Gastmans C, Vander Stichele R, Engels Y, et al. Implementing the theory-based advance care planning ACP+ programme for nursing homes: study protocol for a cluster randomised controlled trial and process evaluation. BMC Palliat Care. 2020;19(1):5.

[23] Boblin S, Baxter P, Alvarado K, Baumann A, Akhtar-Danesh N. Registered nurses and licensed/registered practical nurses: a description and comparison of their decision-making process. Nurs Leadersh (Tor Ont). 2008;21(4):56-72.

[24] Kozier B, Erb, Glenoa., Berman, Audrey., Snyder, ShirleeJ., Frandsen, Geralyn. Buck, Madeleine., Ferguson, Linda. Stamier, Lynnettal. Fundamentals of Canadian Nursing Concepts, Process, and Practice. 4 ed. USA, Hoboken: Pearson Canada Inc.; 2018. 412-58 p.

[25] Hagos F, Alemseged F, Balcha F, Berhe S, Aregay A. Application of Nursing Process and Its Affecting Factors among Nurses Working in Mekelle Zone Hospitals, Northern Ethiopia. Nurs Res Pract. 2014:675212.

[26] Ozdemir AA, Tunk GC. Gender and career: female and male nursing students' perceptions of male nursing role in turkey. Health Science Journal. 2008;2(3):153-61

[27] Tuomikoski AM, Ruotsalainen H, Mikkonen K, Kaariainen M. Nurses' experiences of their competence at mentoring nursing students during clinical practice: A systematic review of qualitative studies. Nurse education today. 2020;85:104258.

[28] Alqahtani N, Oh KM, Kitsantas P, Rodan M. Nurses' Evidence-based Practice Knowledge, Attitudes, and Implementation: A Cross-sectional Study. Journal of clinical nursing. 2019.

[29] Baraki Z, Girmay F, Kidanu K, Gerensea H, Gezehgne D, Teklay H. A cross sectional study on nursing process implementation and associated factors among nurses working in selected hospitals of Central and Northwest zones, Tigray Region, Ethiopia. BMC nursing. 2017;16:54.

[30] Miskir Y, Emishaw S. Determinants of Nursing Process Implementation in North East Ethiopia: Cross-Sectional Study. Nurs Res Pract. 2018;2018:7940854.

[31] NingWang, PingYu, DavidHailey. Description and comparison of documentation of nursing assessment between paper-based and electronic systems in Australian aged care homes. international journal of medical informatics. 2013:9.

[32] Bravetti C, Cocchieri A, D'Agostino F, Vellone E, Alvaro R, Zega M. A nursing clinical information system for the assessment of the complexity of care. Ann Ig. 2018;30(5):410-20.

[33] Lee TT. Nursing diagnoses: factors affecting their use in charting standardized care plans. Journal of clinical nursing. 2005;14(5):640-7.

[34] Docherty-Skippen SM, Hansen A, Engel J. Teaching and assessment strategies for nursing self-care competencies in Ontario's nursing education programs. Nurse Educ Pract. 2019;36:108-13.

[35] Muller-Staub M. Evaluation of the implementation of nursing diagnoses, interventions, and outcomes. International journal of nursing terminologies and classifications : the official journal of NANDA International. 2009;20(1):9-15.

[36] Muller-Staub M, Lunney M, Odenbreit M, Needham I, Lavin MA, van Achterberg T. Development of an instrument to measure the quality of documented nursing diagnoses, interventions and outcomes: the Q-DIO. Journal of clinical nursing. 2009;18(7):1027-37.

[37] Aloisio LD, Baumbusch J, Estabrooks CA, Bostrom AM, Chamberlain S, Cummings GG, et al. Factors affecting job satisfaction in long-term care unit managers, directors of care and facility administrators: A secondary analysis. J Nurs Manag. 2019.

[38] Aloisio LD, Gifford WA, McGilton KS, Lalonde M, Estabrooks CA, Squires JE. Factors Associated With Nurses' Job Satisfaction In Residential Long-term Care: The Importance of Organizational Context. J Am Med Dir Assoc. 2019.

[39] Martin PA, Dugan J, Freundl M, Miller SE, Phillips R, Sharritts L. Nurses' attitudes toward nursing process as measured by the Dayton Attitude Scale. Journal of continuing education in nursing. 1994;25(1):35-40.

[40] Leoni-Scheiber C, Mayer H, Muller-Staub M. Relationships between the Advanced Nursing Process quality and nurses' and patient' characteristics: A cross-sectional study. Nurs Open. 2020;7(1):419-29.

[41] Mwangi C, Menganyi, Lucy W. Mbugua, Ruth G. Utilization of the Nursing Process among Nurses Working at a Level 5 Hospital, Kenya. International Journal of Nursing Science. 2019;9(1):1-11.

[42] Akbari M, Shamsi A. A Survey on Nursing Process Barriers from the nurses' view of Intensive Care Units Iranian Journal of Critical Care Nursing. 2011;4(3):181-6

[43] McCreedy E, Loomer L, Palmer JA, Mitchell SL, Volandes A, Mor V. Representation in the Care Planning Process for Nursing Home Residents With Dementia. J Am Med Dir Assoc. 2018;19(5):415-21.

[44] Milne D. 'The more things change the more they stay the same': factors affecting the implementation of the nursing process. J Adv Nurs. 1985;10(1):39-45.

[45] Florence. O. Adeyemo, Adenike A A E Olaogun. Factors Affecting The Use Of Nursing Process In Health Institutions In Ogbomoso Town, Oyo State International Journal of Medicine and Pharmaceutical Sciences (IJMPS) 2013;1(1):91-8.

[46] Madrid M. [Hospital nursing conducted according to Rogers' theory. The participating process of human field patterning in a clinical environment]. Pflege. 1996;9(4):246-54; discussion 55-6.

[47] Dellai M, Saiani L, Zampieron A. [Factors influencing the learning process during apprenticeship. Study of the nursing students' perceptions in the Trento Nursing School]. Riv Inferm. 1998;17(3):173-9.

[48] Arkan B, Ordin Y, Yilmaz D. Undergraduate nursing students' experience related to their clinical learning environment and factors affecting to their clinical learning process. Nurse Educ Pract. 2018;29:127-32.

[49] Alqahtani N, Oh KM, Kitsantas P, Rodan M. Nurses' evidence-based practice knowledge, attitudes and implementation: A cross-sectional study. Journal of clinical nursing. 2020;29(1-2):274-83.

.