Integrating Orem's Self Care Model as A Framework for Standardized Nursing Care Plan Construction: A Quasi Experimental Study

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Abstract

Introduction: Nursing education worldwide strives to develop strategies and methodologies to improve student learning and performance. The most effective and proven way in an actual nursing degree training course is the application of the nursing process and its end product – the nursing care plan (NCP) or care plan. Nursing care plans (NCP) provide a means of communication among nurses, their patients and other health care providers to achieve health outcomes. In its absence, theplanning process, quality, and consistency in patient care will be lost. It is a challenge for nursing students to devise a nursing care plan. A nursing student goes into the process of knowledge acquisition and banking in order to fully understand how to devise an acceptable plan of care. Nursing process or nursing care plan construction has been identified as the foremost pillar of nursing education and clinical instruction. A plan of care builds the nursing student's ability to fully integrate concepts acquired during the course of theoretical exposure until the hands-on plan of care is administered to the patient. The study generally aims to improve the quality of student training by enhancing teaching modalities that suit the baccalaureate degree.

Methods: The study is a Quasi-Experimental that utilizes a crossover technique and a retrogressive document analysis. Consecutive sampling was used and the population is N=103 nursing students, 7 nursing care plan templates and 247 nursing care plans. For the data analysis a descriptive Statistics, Percentage & Frequencies, Mean Rating & Mean Average, T-Test &Anova through Pillai's trace and Bonferroni alpha were utilized.

Results: They reveal that the nursing care plan templates prior to training are not standard and differ in format in each specialization and year level. The results reveal that there were significant differences between the pretest and posttest in assessment $[t(51.31)=11.052, p<0.01]$, nursing diagnosis $[t(49.32)=2.564, p=0.013]$, implementation $[t(49.01)=6.507, p<0.01]$, rationale $[t(106)=7.694, p<0.01]$, evaluation $[t(83.89)=6.172, p<0.01]$and aesthetic look $[t(106)=9.872, p<0.01]$. The assessment was seen lowest in all nursing care plan components in both pretest and posttest. A second-year student has shown the most improved performance in all three-year levels.

Conclusion: In conclusion, there is a need to improve the nursing care plan template and the nursing training in constructing quality nursing care plans. There is a marked improvement in the performance of the nursing students at all year levels after the intervention program adapting Orem's Theory. Assessment continues to be the weakness of students even after the intervention program has been given.

Keywords: *Nursing care plan; care plan construction; care plan competency; Orem's theory.*

INTRODUCTION

The most effective and proven way in an effective nursing degree training course is the utilization of the nursing process and its end product – the nursing care plan or care plan. Nursing care plans provide a means of communication among nurses, their patients and other health care providers to realize health outcomes. In its absence, the planning process, quality and consistency in patient care will be lost. It is a challenge for nursing students to devise a nursing care plan (NCP). A nursing student goes into the process of knowledge acquisition and banking in order to fully understand how to devise an acceptable plan of care. Nursing process or nursing care plan construction has been identified as the foremost pillar of nursing education and clinical instruction. A plan of care builds the nursing student's ability to fully integrate concepts acquired during the course of theoretical exposure to hands- on plan of care administered to the patient.

Oman nursing training and education system has taken bold actions in improving the nursing education in the sultanate by shifting its gears from a general nursing program to a baccalaureate degree in nursing in 2014. The demands for more innovative strategies and modalities to cater the growing scope and needs of the baccalaureate degree are evident in the evolving patterns of didactics and clinical environment. It is proposed that writing care plans allows clinical instructors to assess the planned care-related actions of students during their clinical training. Throughout this evaluation, the instructor is able to review if the nursing student has delivered complete assessment data to support the nursing diagnosis and reached the interventions recognized to help resolve the health problems of the patient [1]. Nursing educators are motivated on developing critical thinking skills and problem- solving skills in students[2]. The ever-changing healthcare environment, complexities of patient problems, and nursing education system requires competent and knowledgeable nursing that is well-versed in problem solving and critical thinking. Therefore, traditional models of nursing education where students are passive recipients do not encourage critical thinking[3]. To address this shortcoming, nursing educators are trying to apply new and different methods to develop student's critical thinking skills and ensure active learning[4-6].

This study is anchored in a belief that basic foundations are laid out and strengthened during the students'formative years in College. It is essential and imperative to arm the students with updated knowledge and essential attitude in implementing the plan of care. Proper care planning will aid develop and reinforce their competencies in application, interpretation, analysis, decision-making and problem- solving needed in providing competent, safe, and quality care[7]. Refining the instructional strategies and providing emphasis and attention to the learning requirements of the nursing students will add to better learning, improved skills, and promotion of positive attitudes toward learning and patient care. The application of pragmatic theory models can be seen as a way of developing the quality of care.Hence, the study seeks to integrate Dorothea Orem'sSelf-care model which leads to lower healthcare cost, quality in care development and patient outcome improvement [8]. Dorothea Orem's theory is the basis for many curricula across the world and subsequently curriculum design and redesign affords faculty the opportunity to pursue alternative methods to the present blueprint of their academic program, material must be concisely presented like that of theories such Orem's self-care deficit theory. [9]Orem's theory has the potential of improving student nurses education which aims to bridge the gap between theory and practice[10, 11, 12]. Orem's self-care model and nursing practices called Nursing System Theory consists of wholly compensatory nursing system and supportive educative nursing system[8].

This research is a first of its kind in the GCC (Gulf Cooperating Council) as there are no similar or existing studies that tackle student's competencies in constructing a nursing plan of care. This study also has the potential to enhance the delivery of care owing to nursing students' vast knowledge and acquired skills resulting from the intervention that yields positive effects on their overall competence after graduating BSN. Nursing care plan are first taught and introduced in the first year of the BSN (Bachelor of Science in Nursing). A standard international format following the five basic phases of NCP is used by the college with differing template from one year to another. A NCP is a primary requirement of students undergoing clinical placements and are also utilized as evaluative tool during clinical examination. To date there is no uniform

NCP template prescribed in the college each year level and course specialization uses different nursing care plan patterns. This study aims to enhance nursing education and act as a basis of enriching evaluative and corrective system on the students' nursing plan of care in which the components of problem solving, decision making and critical thinking are integrated.

Research Objectives

The study specifically targets the following specific objectives:

1. Develop, test and evaluate an intervention to enhance students' abilities to construct nursing care plan.

2. Develop a standardized care plan template for use of all students for all the course of the program.

Hypothesis & Research Questions

H1: There is significant difference between pretest& posttest nursing care plan marks.

This study seeks to answer the following research questions:

R1: What are the students' strengths and weaknesses phase wise in care plan construction according to year level and nursing care plan component pre-intervention?

R2: What is the degree of improvement attained by the student according to year level and nursing care plan component post- intervention?

METHODOLOGY

The study utilized a crossover quasi–experimental design done using trials without randomization together with a qualitative document analysis of the nursing care plan templates. The study procedure involved a pre and post evaluation of student care plans and the analysis of pre-intervention care plan formats. Dorothea Orem's three levels of self-care system was integrated in the training program content, evaluation criteria / expectations in the rubrics and as a guiding frame in the pre-developed nursing care plan template.

Pretest

Phase 1: A qualitative examination of the existing nursing care plan formats from year two to year four is assessed according to the completeness of nursing care plan components (assessment, nursing diagnosis, planning, implementation, rationale & evaluation). Aesthetic look in terms of format, organization, design of the format was also evaluated.

Phase 2: Students existing care plans pre intervention created based on the existing templates and methods are marked systematically using a standard marking rubricspre developed to identify the student level of competency per year level and per nursing care plan components. The result of the qualitative nursing care plan evaluation and the pretest nursing care plan evaluation result are utilized to develop the training program module integrated with Orem's self-care system as a guiding framework.

The nursing care plan templates were framed using the three levels of self-care as a guide points in the nursing care plan and are set as evaluative criteria in the pre formed NCP rubrics.

Intervention

A hundred and three students and 33 faculty members coursed through an intervention training program devised to integrate Orem's self-care and system theory. The integration of Orem's Self-care theory in the template format and the inclusion of the three- system model in planning and implementation were included in the training program provided to 103 nursing students from year two to four and 33 nursing faculty members. The training program is a series of four lecture workshops for students and 1 for faculty members from year 2 to 4 based on the module developed to address the needs according to the pretest qualitative evaluation of the year two to four professional nursing courses, nursing care plan templates, as well as the result of the pretest evaluation of the students' nursing care plan in seven (7) professional nursing courses from year two to four. The lecture was given by four trained faculty members and the session lasted one and a half hour each for each year level.

Post-test

Post intervention students were asked to write a plan of care as a part of their nursing professional course requirements. Random selection of care plan from daily care plan, case study care plan, and final and continuous evaluation were taken as samples. The care plan was constructed based on the skills

and knowledge learned from the training intervention. Post intervention care plans are evaluated using the pre-developed standardized rubrics. Considering this, the researchers identified the level of nursing care plan competencies according to year level and nursing care plan components post intervention.

Sample and Sampling Techniques

Table 1

	Phase 1	N	Purpose	Sample	
				Included	Excluded
Quantitative	**Pilot Testing** Document Analysis of Randomly Selected Care Plan	**Y2 to Y4 BSN** **20 NCP**	Assessment of students' weakness and strengths in care plan construction. NCP –Rubrics Trial	Students From Year 2 to 4	1st Year BSN Foundation Students Other regional colleges
Quantitative	**Phase 2- Actual Stage –** on consecutive sampling	**Y2 to Y4 BSN 144 NCP**	Generate results using standard rubrics.	Students From Year 2 to 4	1st Year BSN Foundation Students Other regional colleges
	Intervention- Training				
Quantitative	**Phase 3 --** on consecutive sampling	**Year 2 to Year 4 BSN 103 NCP**	Generate results using standard rubrics; Evaluate the intervention program; Devise rubrics suited per year level.	Students From Year 2to 4	1st Year BSN, Foundation Students Other regional colleges

Sample Design

The sampling technique utilized consecutive sampling and inclusion of all nursing care plans. The student-created pre-test 144 and posttest 103 nursing care plans were analyzed.

Table 2

BSN Batch	OCHS Dhofar - Population	Sampling NCP Pretest –Posttest		Total Student Population for each Year
Y2		31	31	**31**
Y3	103	36	36	**36**
Y4		72	36	**36**
Nursing Care Plan		**144**	**103**	**103**

Data Gathering Procedure

Once consent is granted to handle appropriate documents, the proponents utilized a retrogressive document analysis.This method is based on the students' previous nursing care plans during Semester I & Semester II of SY -2018-2019. Nursing care plans obtained from the clinical practicum requirements of students taking Adult Health Nursing Practicum I, Maternal & Child Health Practicum, Community Health Nursing Practicum, and Mental Health Nursing Practicum in semester one, and Adult Health Nursing Practicum II, Maternal & Child Health Nursing and Comprehensive Clinical Practicum in semester two. The care plans are marked to assess the strengths and weaknesses in care plan construction on areas of Assessment, Nursing Diagnosis, Planning,

Intervention, Evaluation, and overall Aesthetic Look of the plan of care prior to intervention. The values and information gathered in the pre-evaluation was utilized in devising an intervention program that incorporates the system theory and self-care deficit theory by Orem. Post intervention rubrics were utilized to mark the care plan of the students' post intervention. A training module on nursing care plan standardization was developed. This module was utilized to conduct a series of lecture-training for faculty and students.

Data Collection Techniques

Two techniques were utilized to collect necessary data from the students' nursing care plan. A qualitative analysis of the nursing care plan templates from seven professional nursing courses was performed using an evaluation form that rates the comprehensiveness, completeness, usability, and application of the nursing care plan templates in the specific year level course requirements. A retrospective document analysis was done on the nursing care plans pre and post intervention using a pre-developed nursing care plan rubrics. The rubrics contained seven (7) criteria comprised of 21 items that screen the sufficiency of the written inputs based on the seven (7) criteria of the Nursing Care Plan.

Criteria a. Assessment comprised of five (5) items rated according to their sufficiency from (0-3).

Criteria b. Nursing Diagnosis comprised of six (6) items rated for their sufficiency from (0-3).

Criteria c. Planning comprised of six (6)items rated for their sufficiency from (0-3).

Criteria d. Implementation comprised of twelve (12) items rated for their sufficiency from (0-3).

Criteria e. Rationale comprised of four (4) items rated for their sufficiency from (0-3)

Criteria f. Evaluation comprised of two (2)items rated for their sufficiency from (0-3).

Criteria g. comprised of four (4) items rated for their sufficiency from (0-3).

The tool was tested for reliability Cron bach α results 0.96 reliability. Face validation was done by 2 external experts in nursing.

Analysis

The results of this study were analyzed and interpreted using the Statistical Package for Social Sciences SPSS 24.0(IBM Incorporation, Chicago,IL,USA) considering the following:

a. Weighted Means & Standard Deviation: determined the average competencies of students on their nursing care plans: Pre- Test and Post Test. Table 3

Weight	Mean Range	Adjectival Rating	Interpretation
3	3.00 -2.24 ≥	Very Sufficient	Very Satisfactory
2	≤ -2.23-1.50	Sufficient	Satisfactory
1	1.49-0.75 ≥	Deficient	Unsatisfactory
0	≤0.74-0.00	Very Deficient	Poor

b T- Test , repeated measures ANOVA through Pillai's trace and Bonferroni alpha: To compare pretest and posttest competencies of students' nursing care plans. The significance level was considered at α.05

Ethical Considerations

An IRB was obtained dated 29/1/2018 under the local MOH –RERAC committee in Dhofar and a separate letter of permission addressed to the Associate Dean of Oman College of Health Sciences, Dhofar branch was also secured to gain access to students' nursing care plans from the nursing professional courses from year two to four. Performing experimental studies in the academe that involves interventions are seen as advantageous to student learning. To control group through experiment means withholding essential learning from being fully assimilated by all students, which may possibly violate students' rights if not executed properly. A consecutive sampling absolves this ethical issue by involving all students and utilizing a quasi-experimental study instead of a randomized control trial. The student participants were informed during the training that participation in the research study and evaluation of student care plans will have no bearing on their academic and clinical marks. The students were also informed that they can withdraw from the study anytime. 103 nursing students consented to participate in the study out of 138 students.

RESULTS

Pretest result Phase 1: A careful analysis of seven (7) specimen nursing care plan templates reveal the following qualitative findings. In the examination of the nursing care plan template according to format and structure, majority of the nursing care plans(7 out of 7) show disarrangement of the components, missing nursing care plan components, and the utilization of non-standard care plan terms as separate components. Three out of seven care plan templates have missing column components such assessment, rationale, and evaluation. There is notable disarray in the placement of nursing components such as nursing diagnosis being placed prior to assessment or assessment being placed as a sub- component of another main nursing care process phase, i.e. assessment under nursing diagnosis or outcome criteria replacing the evaluation part. Six out of seven nursing care plans utilized non- standard terms in their templates. The use of terms observation, outcome, outcome criteria goal, objectives implementation, nursing planning, and implemented nursing intervention were placed as main component headings or sub- components in a main column. The spaces provided vary accordingly, and what was observed generally is that the spaces provided do not coincide with the length of required inputs in the specific nursing care plan components. The study result on demographics is comprised of nursing students in three different year levels: 30% is from second year, 35 % from third year and 35 % from fourth year. The study population is comprised of 11% male nursing students and 89% female nursing students when grouped according to gender.

Table 4. *Means, Standard Deviations and Qualitative Descriptions of the Pretest Performance of the Students in each NCP components*

	Year Level	N	Mean	Std. Deviation
Assessment	second year	31	0.58	1.025
	third year	44	0.68	0.934
	fourth year	72	0.17	0.504
Nursing Diagnosis	second year	30	1.97	0.490
	third year	44	1.95	0.429
	fourth year	72	1.88	0.580
Planning	second year	31	0.97	0.836
	third year	44	1.66	0.526
	fourth year	72	1.57	0.766
Implementation	second year	31	0.48	0.626
	third year	44	1.14	0.510
	fourth year	72	0.57	0.577
Rationale	second year	31	0.45	0.850
	third year	44	1.45	0.663
	fourth year	72	0.56	1.047
Evaluation	second year	31	0.65	1.170
	third year	44	1.68	1.360
	fourth year	72	1.33	1.075
Aesthetic Look	second year	31	0.61	1.086
	third year	44	1.50	0.665
	fourth year	72	0.94	0.837
Overall Mean Score	second year	31	0.81	0.585
	third year	44	1.44	0.461
	fourth year	72	1.00	0.412

Shown in Table 4, Phase 2: the pretest performance of the nursing students across all levels in the nursing diagnosis was sufficient or satisfactory. In terms of Assessment, the nursing students' pretest performance was very deficient or poor. In terms of planning, the students' performance was also sufficient / satisfactory except for second-year nursing students with deficient/unsatisfactory performance. In terms of implementation and rationale, the nursing students' performance was very deficient or poor except for the third year students with deficient or unsatisfactory. In terms of Evaluation and Aesthetic Look, the second year nursing students have very deficient or poor performance, the third year nursing students have sufficient/satisfactory and the fourth year students have deficient or unsatisfactory performance. It can also be seen in the table that the mean scores of the second year, third year and fourth year students' performance in the NCP components ranges from 0.45 to 1.97, 0.68 to 1.95 and 0.17 to 1.88 respectively. It was also observed that the lowest performance qualitatively described as very deficient/poor and the highest qualitatively described as deficient or satisfactory were consistently the Implementation and Nursing Diagnosis respectively. It also appears

that the second year nursing students were the most knowledgeable in Nursing Diagnosis and fourth year students were the least knowledgeable in Assessment. Moreover, it was also observed that the performance of the third year nursing students across all the components was highest, followed by the fourth year and the lowest performance was obtained by the second year students except in the Assessment and Nursing Diagnosis. Hence, it appears that the third year students were the most knowledgeable in Nursing Care Plan while the second year nursing students were the least knowledgeable in the majority of the Nursing Care Plan components. However, the overall result in the pretest performance of the students across all year levels was deficient or unsatisfactory.

Table 5. *Means, Standard Deviations and Qualitative Descriptions of the Student's Pretest Performance in the NCP Components*

Component	Mean	Std. Deviation
Assessment	0.41	0.809
Nursing Diagnosis	1.92	0.519
Planning	1.47	0.761
Implementation	0.72	0.628
Rationale	0.80	0.998
Evaluation	1.29	1.234
Aesthetic Look	1.04	0.906
Overall Mean Score	1.09	0.522

As gleaned on Table 5, the nursing students performed lowest in assessment and highest in nursing diagnosis in the pretest. This supports the observation in Table 1 when the mean scores in each NCP component were grouped by year level. The table also shows that the nursing students' pretest performance in two components, namely, Assessment and Implementation were very deficient or poor; in four components, namely,Planning, Rationale, Evaluation, and theAesthetic Look were deficient or unsatisfactory; and only one component which is the Nursing Diagnosis was sufficient or satisfactory. Overall, the pretest performance of the nursing students was deficient or unsatisfactory.

Table 6. *Means, Standard Deviations and Qualitative Descriptions of the Posttest Performance of the Students in Each NCP components*

	Year Level	N	Mean	Std. Deviation
Assessment	second year	31	1.74	0.630
	third year	40	1.23	1.050
	fourth year	36	1.69	0.749
Nursing Diagnosis	second year	31	1.74	0.631
	third year	40	2.20	0.608
	fourth year	36	2.31	0.920
Planning	second year	31	1.84	0.583
	third year	40	1.80	0.564
	fourth year	36	1.81	0.980
Implementation	second year	31	2.06	0.629
	third year	40	1.18	0.501
	fourth year	36	1.67	0.926
Rationale	second year	31	1.90	0.473
	third year	40	1.53	0.640
	fourth year	36	2.19	1.037
Evaluation	second year	31	1.55	0.675
	third year	40	2.78	0.800
	fourth year	36	2.53	0.878
Aesthetic Look	second year	31	1.90	0.396
	third year	40	1.73	0.933
	fourth year	36	1.47	0.845
Overall Mean Score	second year	31	1.83	0.384
	third year	40	1.77	0.505
	fourth year	36	1.95	0.580

Table 6 reveals that when students were grouped by year level, the posttest performance of the students in the NCP components was sufficient/satisfactory to very sufficient or very satisfactory in terms of Nursing Diagnosis and Evaluation; sufficient / satisfactory to very sufficient / very satisfactory in terms of Nursing Diagnosis; sufficient or satisfactory in terms of Planning and Rationale; and deficient/unsatisfactory to sufficient or satisfactory in terms of Aesthetic Look. The table also shows that the performance of the second year nursing students was consistently highest in Assessment, Planning, Implementation, and Aesthetic Look. This corroborates with the result in Table 1, that second year students were consistently

lowest in the pretest performance. Hence, it appears that the second year nursing students have the highest improvement in performance from being lowest to highest after the training. The performance of the third year students was highest in Evaluation while fourth year students' performance was highest in Rationale. The performance of the second, third, and fourth year students ranges from 1.55 to 2.06; 1.18 to 2.78; and 1.67 to 2.53 respectively. This implies that the performance after the training of the second year students was sufficient or satisfactory; the third year students' performance was deficient or unsatisfactory, and the fourth year students' performance was sufficient or satisfactory to very sufficient or very satisfactory. However, the overall mean score reveals that the improvement was from deficient or unsatisfactory to deficient or satisfactory.

Table 7. *Mean, Standard Deviation and Qualitative Descriptions of the Student's Posttest Performance in the NCP Components*

Component	Mean	Std. Deviation
Assessment	1.53	0.872
Nursing Diagnosis	2.10	0.764
Planning	1.81	0.729
Implementation	1.60	0.787
Rationale	1.86	0.806
Evaluation	2.34	0.941
Aesthetic Look	1.69	0.794
Overall Mean Score	1.85	0.502

As shown in Table 7, the performance of the students improved to sufficient or satisfactory in all the Nursing Care Plan components except for Evaluation. The performance of the nursing students in terms of the evaluation was very sufficient or very satisfactory. Overall, the performance of the students after the training was sufficient or satisfactory.

Table 8. *Comparison of Mean Pretest and Posttest in each of the NCP Components of the Second Year Nursing Students*

	Test	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Assessment	Pretest	31	0.58	1.025	5.371	49.86	.000**
	Posttest	31	1.74	0.631			
Nursing Diagnosis	Pretest	30	1.97	0.490	1.557	56.40	.125
	Posttest	31	1.74	0.631			
Planning	Pretest	31	0.97	0.836	4.758	53.59	.000**
	Posttest	31	1.84	0.583			
Implementation	Pretest	31	0.48	0.626	9.920	60	.000**
	Posttest	31	2.06	0.629			
Rationale	Pretest	31	0.45	0.850	8.309	46.95	.000**
	Posttest	31	1.90	0.473			
Evaluation	Pretest	31	0.65	1.170	3.722	47.98	.001**
	Posttest	31	1.55	0.675			
Aesthetic Look	Pretest	31	0.61	1.086	6.217	37.85	.000**
	Posttest	31	1.90	0.396			
Overall Mean Score	Pretest	31	0.81	0.585	8.083	60	.000**
	Posttest	31	1.83	0.384			

*significant at 0.01   **significant at 0.05

As seen in Table 8, the second year nursing students' posttest performance was higher in posttest than in pretestin all the components except in Nursing Diagnosis. Similarly, the table also shows that there was a significant difference in the students' performance in the pretest and posttest except in Nursing Diagnosis [t(56.40) = 1.557, p=0.125]. This indicates that the students who created their Nursing Care Plan after the training obtained significantly higher scores in Assessment [t(49.86) = 5.371, p<0.01]; Planning [t(53.59) = 4.758, p<0.01]; Implementation [t(60) = 9.92, p<0.01]; Rationale [t(46.95) = 8.309, p<0.01];

Evaluation [t(47.98) = 3.772, p=0.001]; and Aesthetic Look [t(37.85) = 6.217, p<0.01] than those second year nursing students who took the test only before the training. The improvement of the second year nursing students may be attributed to the training given to them. However, there is a need to review the possible cause of the non-improvement of the students in the nursing diagnosis and the decrease in performance in this component. Generally, the performance of the second year nursing students significantly improved after the training than when they created the Nursing Care Plan before the training [t(60) = 8.803, p<0.01].

Table 9. *Comparison of the Students' Pretest Performance in each of the components of the Nursing Care Plan*

(I) factor1	(J) factor1	Mean Difference (I-J)	Std. Error	Sig.
Assessment	Nursing Diagnosis	-1.507	.066	.000**
	Planning	-1.055	.084	.000**
	Implementation	-.315	.072	.000**
	Rationale	-.397	.096	.001**
	Evaluation	-.890	.106	.000**
	Aesthetic Look	-.637	.082	.000**
Nursing Diagnosis	Planning	.452	.070	.000**
	Implementation	1.192	.062	.000**
	Rationale	1.110	.085	.000**
	Evaluation	.616	.100	.000**
	Aesthetic Look	.870	.075	.000**
Planning	Implementation	.740	.072	.000**
	Rationale	.658	.092	.000**
	Evaluation	.164	.099	1.000
	Aesthetic Look	.418	.083	.000**
Implementation	Rationale	-.082	.087	1.000
	Evaluation	-.575	.102	.000**
	Aesthetic Look	-.322	.071	.000**
Rationale	Evaluation	-.493	.118	.001**
	Aesthetic Look	-.240	.087	.133
Evaluation	Aesthetic Look	.253	.098	.226

Pillai's Trace F(6,140)=114.58, p<0.01

As shown in the Table 9, the pretest performance of the students or the performance of students before the training in the assessment were significantly lower than their performance in Nursing Diagnosis, Planning, Implementation, Rationale, Evaluation, and Aesthetic Look. The students' performance in Nursing

Diagnosis was significantly higher than Planning, Implementation, Rationale, Evaluation and Aesthetic Look. Moreover, their performance in planning was significantly higher than Implementation, Rationale, and Evaluation.But their performance in Evaluation was the same as in Planning. Their performance in

Implementation was significantly higher than Evaluation, Aesthetic Look, and the same with Rationale. Their performance in Rationale is significantly higher than Evaluation but the same with Aesthetic Look. Their performance in Aesthetic Look was the same as Evaluation. This means that the students significantly performed the lowest in Assessment before the training. They performed highest in Nursing Diagnosis followed by Planning or Evaluation, then Implementation or Rationale, Evaluation or Aesthetic Look and the lowest in Assessment.

Table 10. *Summary of Pre Test Post Test performance according to Year Level and Nursing Care plan Components*

		2nd			3rd			4th		
	Test	N	Mean	t(p)	N	Mean	t(p)	N	Mean	t(p)
Assessment	Pre	31	0.58	5.371 .000**	44	0.68	2.509 (.014*)	72	0.17	11.052 (.000**)
	Post	31	1.74		40	1.23		36	1.69	
Nursing Diagnosis	Pre	30	1.97	1.557 (.125)	44	1.95	2.120 (.038*)	72	1.88	2.564 (.013*)
	Post	31	1.74		40	2.20		36	2.31	
Planning	Pre	31	0.97	4.758 (.000**)	44	1.66	1.185 (.239)	72	1.57	1.372 (.173)
	Post	31	1.84		40	1.80		36	1.81	
Implementation	Pre	31	0.48	9.920 (.000**)	44	1.14	.350 (.727)	72	0.57	6.507 (.000**)
	Post	31	2.06		40	1.18		36	1.67	
Rationale	Pre	31	0.45	8.309 (.000**)	44	1.45	.494 (.622)	72	0.56	7.694 (.000**)
	Post	31	1.90		40	1.53		36	2.19	
Evaluation	Pre	31	0.65	3.722 (.001**)	44	1.68	4.537 (.000**)	72	1.33	6.172 (.000**)
	Post	31	1.55		40	2.78		36	2.53	
Aesthetic Look	Pre	31	0.61	6.217 (.000**)	44	1.50	1.261 (.211)	72	0.94	3.079 (.003**)
	Post	31	1.90		40	1.73		36	1.47	
Overall Mean Score	Pre	31	0.81	8.083 (.000**)	44	1.44	3.195 (.002**)	72	1.00	9.872 (.000**)
	Post	31	1.83		40	1.77		36	1.95	

*significant at 0.05   **significant at 0.05

Table 10 shows that there was a significant difference in the students' posttest performance in NCP components, $F(6,101)=9.814$, $p<0.01$. The result shows that the students' performance in Assessment was significantly lower than Nursing Diagnosis, Planning, Rationale, and Evaluation. However, the performance in Assessment was the same as Implementation and Aesthetic Look. Their performance in Nursing Diagnosis was significantly higher than in Planning, Implementation and Aesthetic Look but the same with Rationale and Evaluation. Their performance in planning was the same as Implementation, Rationale, and Aesthetic Look but significantly lower than Evaluation. Their performance in Implementation was the same as Rationale and Aesthetic Look but significantly lower than Evaluation. Their performance in Rationale was significantly lower than Evaluation and the same as Aesthetic Look. Their performance in Evaluation was the same as Aesthetic Look. The result shows that after the training, the students' performance in the Assessment was still the lowest and the same with Aesthetic Look. Their performance in Nursing Diagnosis was the same with Rationale and Evaluation. Their performance in Planning was the same in Implementation and Rationale while Rationale was the same with Aesthetic Look.

DISCUSSION

The result of phase 1qualitative template analysis and pre-test of the current research showed that a standardized Nursing Care Plan format is necessary to instill critical thinking among nursing students. Conventionally, the Nursing Care Plan has been used to apply the steps of the nursing process in planning patient care. Nevertheless, nursing has grown into a more multifaceted profession that requires expanded ways of discerning and thinking beyond the linear methods used in the past [13]. The standardized Nursing Care Plan can be time-consuming if it has an undesirable content design based on the experiences of Taiwanese nurses [14]. Standardized Nursing Care Plans can be utilized as an important teaching-learning tool to aid in improving the students' critical thinking and the use of the clinical eye. Standardized documentation exhibited more positive than negative effects with respect to quality and the use of the nursing process [15]. Nursing Care Plan greatly contributes to achieving holistic care and critical thinking [16]. A succinct, streamlined care plan comprises both standards of care and collaborative problems that require less time to produce and evaluate [17].

The Nursing process has evolved into five steps which include Assessment, Nursing Diagnosis, Planning, Implementation and Evaluation [18]. Assessment is the initial phase of the nursing process and the first step in the Nursing Care Plan construction and is defined as the methodical and steady collection, organization, validation and documentation of data [19]. Assessment is an essential foundation of care planning study results that reflect whether the students have a deficient level in terms of Assessment. It is required that each client have apreliminary nursing assessment consisting of history and physical examination[20]. Orem's universal self-care requisites in assessment deals with eight categories that span from sufficient intake of air,water,food, provision of elimination, maintenance of balance between activity and rest, prevention of hazards, and promotion of human functioning and development. It is necessaryto meet these assessment parameters to establish assessment data and information [21]. Throughout the study, the formulation of a Nursing Diagnosis based on NANDA has been consistently satisfactory. A Nursing Diagnosis can be defined as the analysis of the (identified and collected- to identify the client's needs or problem

with the purpose of drawing a conclusion regarding the client's specific needs [22]. The ability to gather cues and to diagnose is significantly different among nursing students and staff nurses [23]. Diagnosing improves the students' problem-solving skills [24], similarly, continuing education can progress clinical reasoning, as shown by improved attitudes toward and accuracy of nursing diagnosis [25].

In the study, Planning results yielded an unsatisfactory level in the pretest and have improved greatly after the training has been given to the students. Planning is a crucial part of the nursing process that relates to realistically achieving the set goals and objectives for the patient. Orem's approach to planning has been utilized greatly in patient management and in the planning of the care [26, 27, 28]. Implementation requires a combination of cognitive skills, interpersonal skills and technical skills [19]. This can be daunting to student nurses when they try to integrate the concepts all at once when managing their patients in the clinical area. The holistic approach to patient care should be taken into consideration at all times. One study concludes that the use of the model could facilitate effective communiqué among nurses, researchers, and educators when deliberating the development and testing of nursing interventions[29]. Nursing must be able to describe the problems, nursing intervention and outcomes that result from nursing care [30]. There are several factors that affect the construction of nursing care plans such as plenty of paperwork, lack of proper training or quality in professional education and lack of motivation.These are seen as reasons for a poorly constructed nursing plan of care [18]. Written care plans can be used to validate the student performance in the clinical practice although the focus is more on paper works and less on the activities[31].

The study also reveals that Orem's self-care model can improve the nursing students' performance in writing their plan of care. The integration of Orem's theory of self-care deficit and the nursing system theory is widely utilized in nursing practice. Several studies have used the incorporation of conceptual models such as critical thinking into the nursing process, with the goal of empowering nurses to think critically, reason accurately, and make appropriate clinical decisions about their patients [32]. A study suggests that using educational programs enhance the nurse's capability in making a nursing diagnosis that further improves

the quality of nursing documentation[33]. The study findings reveal a marked improvement in the nursing students' care plan construction,and a significant difference in the student performance pretest and posttest were noted. This is similar to the result of a study conducted in Greece wherein the educational intervention was successful in improving the student nurses' skills in constructing their Nursing Care Plans [33]. This is opposite to the study on care plans and concept maps that say that there were no statistically significant differences in the total and sub-scale pre-test scores between the experimental group and control group students in terms of critical thinking [35]. Therefore, it can be said that the intervention program showed a statistically significant difference in the pretest and posttest performance of the students. The training program yielded positive effects on the student Nursing Care Plan construction as seen on the notable difference in their pretest and posttest results. The result reveals that the performance of the students after the training was almost the same in all components supported by the qualitative description of sufficient or satisfactory, nevertheless, the focus of clinical learning is practice [9].

Conclusion

In conclusion, there is a need and a call to improve the Nursing Care Plan template and the nursing training in constructing quality nursing care plans. The existing Nursing Care Plan templates across year levels two (2) to four (4) in seven (7) nursing specialty courses vary greatly in terms of format, structure, content, as well as technical synchronicity. There is a marked improvement in the performance of the nursing students at all year levels after the intervention program adapting Orem's Theory. The utilization of Orem's self-care deficit theory yielded positive change in the students' performance in constructing their plan of care. Assessment and Implementation continue to be the weakness of the students even after the program intervention has been given. Although paper-based, the students' nursing care plan requires the rigorous application of pre-learned concepts and utilization of important psychomotor skills in order for it to be effective and client-based.

Recommendations

There is a great need to revise and review the current care plan templates across the four years Bachelor of Science in Nursing (BSN) specialty courses in the college. The research proposed the utilization of the Nursing Care Plan format based on Orem's Theory as a platform of nursing care plan construction as well as to adapt the standard templates and marking rubrics to ensure that the competencies are maintained throughout the four years of student training. Furthermore, the integration of the self-care model into the Nursing Care Plan can serve as the basis for the required educational intervention to improve the student nursing plan of care writing. Assessment skills should be enhanced as it greatly reflects the competency of the nursing plan of care crafted and implemented by the students. The translation of assessment findings and the correct way of utilizing it are essential components of the nursing process the students are very weak at. Therefore, further training and emphasis should be given to these components since they are the foundation of a well-planned nursing care. It's also recommended that a qualitative research approach or a randomized control trial be used as an in-depth inquiry to underlying causes of poor performance in care planning among BSN students.

Conflict of Interest

The authors declare no conflict of interest

Author Contribution

GFDV substantially contributed to the conception and design; collected, analyzed, and interpreted the data; drafted the article, and approved the version to be published. MBA,ZH,ZSJ,NA,ZD substantially contributed in data analysis, data acquisition, and intellectual inputs. All authors approved the version to be published.

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