

The Effect of the Application of the Team-STEPPS-Based Preceptorship Guidance Model on the Competence of Nursing Students

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Objective: Student competence is an important topic of discussion during the implementation of counseling in the clinic. The purpose of this study was to analyze the effect of the Team-STEPPS-based preceptorship guidance model on student competency.

Methods: A comparative study was used to analyze the quantitative data. Participants were clinical practice students at “Ngudi Waluyo” Public Hospital with a total of 92 registered students divided into treatment and control groups. The Wilcoxon Signed Rank Test and the Mann–Whitney *U*-Test were used to assess differences between the intervention and control groups.

Results: There were post-test differences between the intervention group and the control group, namely clinical competence *p*-value (0.003), nursing management *p* (0.000), technical competence *p* (0.008), self-management *p* (0.000), and care-oriented patients *p* (0.000).

Conclusion: The Team-STEPPS-based preceptorship guidance model is very important in increasing student competency, not only in mastering clinical competence, but also in mastering technical skill competencies, nursing management, self-management, and patient-oriented care skills, and therefore, can increase student independence.

Keywords: Team-STEPPS, preceptorship model, competence, nursing students

Plain Language Summary

Although there have been many research reports on the preceptorship guidance method and Team-STEPPS, there are still no research reports on the Team-STEPPS-based preceptorship guidance model which is implemented in one complete combination for students when tutors are conducting clinical nursing guidance in improving student competence. So that students are only oriented to clinical skills and the ability to motivate themselves to improve their competence which is directly guided by the preceptor. By using the Team-STEPPS-based preceptorship model in the guidance process for students, students are able to improve their competencies in the areas of solid teamwork and effective communication, in addition to clinical nursing practice and self-motivated skills to improve their competence.

Not only do individual skills improve, but other competencies such as technical skills, nursing management, self-management, clinical skills, and patient-oriented care skills also improve when receiving Team-STEPPS-based preceptorship model guidance. Thus, the use of the Team-STEPPS-based preceptorship guidance method needs to be implemented in a wider clinical environment in guaranteeing quality student competence, so that they are ready to provide quality nursing care to guarantee the demands of patient safety, comfort, and satisfaction, both now and in the future.

Introduction

Professional competence is an important target of the guidance process when students are undergoing clinical nursing practice,¹ and the guidance of the preceptorship model places great emphasis on the achievement of clinical competence,² so that students feel satisfied with their clinical competency achievements, but they are less independent in carrying out assignments because they are very dependent on the preceptor.³ In addition, the supervision model

developed emphasizes only supportive actions rather than challenging students.⁴ Meanwhile, guaranteeing safety and comfort is an essential point in professional nursing services,^{5,6} and this is obtained, when students master several skills independently, which are manifested in the form of how they can help, guide, diagnose, manage to nurse, provide therapeutic interventions, provide quality nursing services, provide service guarantees, and act in a professional role.⁷ However, some patients expressed concern about the performance of nursing students in carrying out clinical practice, apart from being insufficient to guarantee a sense of security and comfort,⁸ mentioning the patient's name, they sometimes forget.⁹

Other studies have also reported that nursing students are also less skilled in providing health education, less skilled in preparing discharge plans, less skilled in physical care, less attentive to patients' emotional responses, and less skilled in administrative services when undergoing clinical nursing practice,¹⁰ besides they are less able to develop patterns of communication and teamwork.¹¹ Therefore, the guidance pattern of the preceptorship model needs to be improved and developed, not only oriented towards individual skills but more than that can make students independent in providing nursing care so that they can guarantee a sense of security and comfort for their patients because this is also a patient need while undergoing treatment.¹

This is very worrying about patient safety because some nursing actions for certain patients require interrelationships, connections, and collaborations between several professional disciplines and fellow nurses.^{12,13} Meanwhile, there have been many research reports that discuss the goal to provide safe and reliable health care and to improve patient outcomes and satisfaction,¹⁴ so the competence of nursing students needs to be developed towards teamwork and building effective communication, in addition to increasing knowledge competence and nursing clinical practice.¹⁵ Thus it is necessary to develop nursing intervention strategies and ways to increase empathy for patients,¹⁶ thus forcing clinical guidance settings to be able to prepare prospective nurses to master professional skills,¹⁷ because learning in a clinical environment is, for the time being, the most ideal place to enhance professional skills.¹⁸

Improving the competence of nursing students in supporting professional abilities is important, and for this reason, it is not enough to use the "preceptorship method", even though this method has used clinical staff as a tutorial in the clinical learning process, because the skills acquired are not enough to guarantee fulfillment of demands the need for professional nursing services.¹⁹ This happened because the guidance orientation with the preceptorship method was based on qualitative research on cognitive abilities and individual management,²⁰ and the diversity of nurse preceptors adds difficulty to the preparation of guidance programs and the development of evaluation instruments,²¹ thus affecting the quality of competence of students.²² Meanwhile, the competencies expected during clinical practice, students are expected to master several competencies, including clinical competence, nursing management, technical competence, individual management, and patient-oriented care.²³ This can increase clinical supervisors' understanding of the impact of competency quality for nursing students on nursing services in general, which can inform the need for the development of clinical mentoring strategies to reduce the potential for negative perceptions from society for nursing services in the future.

The need to integrate new guidance patterns into the "preceptorship method", is an urgent need, so that students can achieve the expected competencies, and the orientation of the selection of preceptor nurse supervisors must be based on the required competency orientation, and not on availability.²⁴ The integration of the "Team-STEPPS" mentoring method is an option among existing nursing student mentoring methods because this guidance method can enable students to achieve satisfactory nurse performance and ensure patient safety.²⁵ In addition to developing effective teamwork and communication skills,²⁶ this method also provides space for teams from different disciplines to collaborate in providing professional services.²⁷ The results of the study reported that by incorporating the "Team-STEPPS" method in clinical learning, facilitative, responsible, and teamwork nursing services can be improved during clinical practice among students,²⁸ and Teamwork in the Team-STEPPS learning model can increase student creativity.²⁹ Thus the application of the Team-STEPPS-based preceptorship model guidance is very necessary to improve the competence of nursing students. The purpose of this study was to explain the effect of applying the Team-STEPPS-based preceptorship model on the competence of nursing students.

Methods

Sampling and Participants

The research took place at the “Ngudi Waluyo” General Hospital. Ethical approval was obtained from the Brawijaya University Ethics Committee. The participants are final-year nursing students who will fulfill the new requirements as nurses. Purposive sampling from this population was used, as many as 92 participants were involved, with 46 participants as the control group and 46 participants as the intervention group. During the study period, there was no change in acceptance criteria, assessment, or program completion rates, reassuring the research team that the groups were similar. Due to COVID-19 regulations regarding face-to-face interactions, data collection was carried out offline following very strict health protocols.

Context

The bachelor’s degree in Nursing at the University of Brawijaya is five years. The first year is Humanities which focuses on general competencies to support the improvement of student attitudes and behavior. Furthermore, in the second to fifth years, there are sessions in the curriculum on the principles and philosophy of caring for sick people, namely about the pathophysiology of the disease, nursing care for sick people at the levels of children, adults, and gerontic, and learning methods have used the Problem-Based Learning method, Case-Based Method or Project Based Method.

Intervention

The mentorship program with the Team-STEPPS-based preceptorship model begins with an exclusive laboratory learning process by a Nursing Lecturer from Brawijaya University and a Practitioner Lecturer from the “Ngudi Waluyo” General Hospital as Team Teaching Lecturers, by explaining the understanding of objectives, benefits, and learning strategies for Laboratory Practice. However, both groups received curriculum lessons in years 2–5, mostly didactic. Laboratory practice is carried out with a “role-playing” model, in providing nursing care to sick people, and between them dividing their respective duties as Primary Nurses and Associate Nurses. Each acted professionally according to their role. Teaching always combines interactive lectures and small group work. Furthermore, students started practicing clinical nursing at the “Ngudi Waluyo” General Hospital for 1 full month and were divided into 2 groups, namely the control group and the intervention group. Meanwhile, the guidance strategy between the two groups was divided into three sessions:

First Session, (pre-conference). Focus Group Discussions are conducted with students to identify problems that occur in patients and their needs, including therapy to be given by doctors, nutrition to be given by nutritionists, physiotherapy measures to be given by physiotherapists, and nursing care to be given in that room.

Second Session: (Bedside teaching). After students accept the duties and responsibilities of caring for patients, they carry out nursing actions and collaborate with other Health Teams, including communicating and collaborating and discussing with treating doctors, nutritionists, physiotherapists, laboratory personnel, and other relevant stakeholders regarding efforts to accelerate patient recovery.

Third session (conference). The supervisor discusses the implementation of the nursing actions that have been given, including the obstacles encountered and a summative evaluation of the results of the nursing actions that have been carried out and the follow-up that will be given as a response to the results of the evaluation that has been carried out.

Research Design

The research design used a Quasi experiment study pre-test post-test with control group to examine the differences between the control group and the intervention group in undergoing clinical nursing practice at “Ngudi Waluyo” General Hospital for 1 full month. The control group only received guidance from nurses in the treatment room, while the intervention group received guidance from 2 nursing lecturers at Brawijaya University (Linda Wieke Noviyanti, S.Kep. Ns., M.Kep and Ike Nesda Rahmawati, S.Kep.Ns., M.Kep) and Practitioner Lecturer from the “Ngudi Waluyo” General Hospital as a Team Teaching Lecturer with a Team-STEPPS-based preceptorship guidance model.³⁰ Guidance is carried out once a week, both for the control group and the intervention group. Both groups were assessed using a checklist. The

control group was assessed at the start of clinical nursing practice. The intervention group was assessed the same after 1 month of clinical nursing practice. Informed consent was obtained from all participants after receiving an explanation from the researcher. Two Lecturers (Dr. Ahsan, S.Kp., M.Kes, and Evi Harwiati Ningrum, S.Kep.Ns., M.Kep) acted as observers to assess student competence after both of them carried out the same perception of the scope being assessed.

Instrument

We used the Indonesian version of the student competency research instrument as a result of the development of the Iranian version of Clinical Competence among MSc Students of Critical Care Nursing, covering clinical competence, nursing management, Technical, Individual, and patient-oriented care.²³ The Indonesian version of student competence is used as a guideline for assessment, consisting of 21 validated statement items to assess various aspects of students' ability to care for sick people with 4 sub-categories, namely very skilled, skilled, unskilled, and very unskilled. This research instrument has 5 different sub-variables:

1. Clinical Competency (5 items)
2. Nursing management (4 items)
3. Technical Competency (4 items)
4. Individual management (4 items)
5. Patient-oriented care (4 items)

Before being used, the Indonesian version of student competency had been tested on 25 nursing students, and through validity and reliability tests, Cronbach's alpha value was obtained with a value of 0.856, so it was suitable for use as a research instrument. The questions were designed first to obtain information about the demographic and academic characteristics of the participants, including gender, year level, and student achievement index, and then, the respondents were assessed using the "student competency" checklist to obtain important information about student competencies while carrying out clinical nursing practice in "Ngudi Waluyo" General Hospital.

Analysis

Statistical analysis was performed using the IBM Statistical Package for Social Sciences (SPSS) version 27.0. Armonk, NY: IBM Corp. To address the first objective, we assessed the frequency and percentage distributions of student characteristics. Next, we calculate the mean and standard deviation to summarize student competency. To determine the significance of the difference between the pre-test and post-test in the intervention group and the control group, the Wilcoxon sign Rank test through a two-sample test was applied. Furthermore, to find out the significance of the post-test differences between the intervention group and the control group, the Mann-Whitney Sign Rank test through an independent sample test was also applied, with the hope that the difference in the scores of participants in the two groups would be known.

Results

Respondent Characteristics

Respondent characteristics include gender, year level, semester level, and the previous semester's Grade Point Average, and can be seen in full in [Table 1](#).

Differences in the Pre-Test and Post-Test of the Intervention Group and the Control Group

The results showed that in the intervention group there was an influence of Team-STEPPS-based preceptorship model guidance on increasing the competence of nursing students. There was a very significant increase between the pre-test and post-test stages in clinical competence p-value (0.000) and Z value (-5.013), nursing management p (0.000) and Z value (-3.742), technical competence p (0.046) and Z (2.00), self-management p (0.000) and Z score (-5.708), patient-

Table I Characteristics of Respondents

No	Characteristics	Intervention Group (n = 46)		Control Group (n = 46)		Homogeneity Test
		n	%	n	%	
1	Gender					0.693
	Male	13	28.26	15	32.61	
	Female	33	71.74	31	67.39	
2	Academic Year Level					0.103
	2020/2021	21	45.65	30	65.22	
	2021/2022	25	54.35	16	34.78	
3	Semester Level					0.054
	Semester 3	10	31.74	12	26.09	
	Semester 4	13	28.26	8	17.39	
	Semester 5	9	19.57	13	28.26	
	Semester 6	14	30.43	13	28.26	
4	Previous semester cumulative grade point average					0.430
	A	29	63.05	27	58.70	
	B+	11	23.91	15	32.60	
	B	6	13.04	4	8.70	
5	Previous course					0.186
	Natural science	23	50.00	25	54.35	
	Social science	15	32.61	12	26.09	
	Language	8	17.39	9	19.56	

oriented care p (0.000) and Z score (5.078). Whereas in the control group that was not guided by the Team-STEPPS-based perception model, and only received guidance from the ward nurse, there was no significant change between the pre-test and post-test stages in the clinical competency scores p (0.414) and Z (-.816), nursing management p (0.197) and Z (-1.291), technical competence p (0.071) and Z (-1.807), self-management p (0.275) and Z (-1.091), patient-oriented care p (0.288) and Z (-1.088) in full can be seen in [Table 2](#)

Post-Test Differences Between the Intervention Group and the Control Group

The results showed that there were differences in the post-test between the intervention group that had received guidance from the Team-STEPPS-based perception model towards increasing the competence of nursing students and the control group that had received guidance from room nurses only. There was a very significant increase in clinical competence p -value (0.000) and Z value (-5.013), nursing management p (0.000) and Z value (-3.742), technical competence p (0.046) and Z (2.00), management self p (0.000) and Z value (-5.708), patient-oriented care p (0.000) and Z value (5.078). Whereas in the control group which was not guided by the Team-STEPPS-based perception model, and only received guidance from the ward nurse, there was no significant change between the pre-test and post-test stages in the clinical competency values of p (0.414) and Z (-.816), nursing management p (0.197) and Z (-1.291), technical competence p (0.071) and Z (-1.807), self-management p (0.275) and Z (-1.091), patient-oriented care p (0.288) and Z (-1.088), which can be seen in full in [Table 3](#)

Table 2 Differences Between Pre-Test and Post-Test in the Treatment Group and the Control Group

No	Student Competency	Intervention Group (n=46)				Difference Test (Z)	p	Control Group (n=46)				Difference Test (Z)	p
		Pre-Test		Post-Test				Pre-Test		Post-Test			
		f	%	f	%			f	%	f	%		
1	Clinical Competency												
	Competent	16	34.78	3	6.52	-5.013	0.000	2	4.35	4	8.70	-0.816	0.414
	Competent enough	25	54.35	43	93.48			42	91.30	36	78.26		
Incompetent	5	10.87	3	6.52	2			4.35	6	13.04			
2	Nursing Management												
	Good	0	0	0	0	-3.742	0.000	0	0	0	0	-1.291	0.197
	Pretty good	41	89.13	42	91.30			31	67.39	36	78.26		
Not good	5	10.87	4	8.69	15			32.61	10	21.74			
3	Technical Competency												
	Competent	0	0	0	0	2.00	0.046	9	19.57	4	8.70	-1.807	0.071
	Competent enough	41	89.13	45	97.83			28	60.87	31	67.39		
Incompetent	5	10.87	1	2.17	9			19.57	11	23.91			
4	Self-Management												
	Good	9	19.57	44	95.65	-5.708	0.000	11	23.91	13	28.26	-1.091	0.275
	Pretty good	34	73.91	2	4.35			33	71.74	24	52.17		
Not good	3	6.52	0	0	2			4.35	9	19.57			
5	Patient oriented care												
	Skilled	7	15.22	37	80.43	5.078	0.000	24	52.17	2	4.35	-1.088	0.288
	Skilled enough	34	73.91	9	19.57			22	47.83	31	67.39		
Less skilled	5	10.87	0	0	0			0	2	4.35			

Notes: Uji Wilcoxon Signed Ranks Test, p <0.05.

Table 3 Differences in Post-Test Results Between the Treatment Group and the Control Group

Student Competency	Intervention Group					Control Group					Difference Test Post-Test
	Pre-Test		Post-Test		p	Pre-Test		Post-Test		p	
	Mean	SD	Mean	SD		Mean	SD	Mean	SD		
Clinical Competency	1.90	0.3	1.98	1.560	0.003	1.90	0.307	1.74	0.442	0.157	0.003
Nursing Management	2.41	0.805	2.41	0.805	0.000	1.41	0.595	1.44	0.641	0.806	0.000
Technical Competency	1.34	0.480	2.54	0.674	0.000	2.41	0.549	2.05	0.605	0.157	0.008
Self Management	3.1304	0.49,927	3.9565	0.20,618	0.000	3.1957	0.49,976	3.0870	0.69,366	0.275	0.000
Patient oriented care	3.0435	0.51,452	3.8043	0.40,109	0.000	3.5217	0.50,505	3.2391	0.52,429	0.288	0.000

Note: Uji Mann Whitney U-Test p < 0.05.

Discussion

This research is different from other studies because it has implemented the Team-STEPPS-based preceptorship model in increasing student competency when guiding students through clinical nursing practice, the benefits of which can improve organizational skills and Clinical Nursing Practice skills. Although the guidance of the preceptorship model for students places more emphasis on individual skills and motivation to practice nursing, as such they are highly skilled in clinical nursing practice and very facilitative with patients because they are directly guided by experienced clinical nurses (Preceptors),² but it is still not enough to guarantee patient safety. For that reason, they also need to have the ability to communicate and collaborate with other health teams while undergoing clinical nursing practice, because to ensure patient safety and accelerate healing, patients also really need their presence. Applying the Team-STEPPS model to the preceptorship model allows students to learn how to communicate and collaborate with other Health Teams within the overall scope of nursing care, in addition to providing learning about technical skills and self-management. This is because the Team-STEPPS model emphasizes organizational culture in nursing practice when practicing in a clinical environment, including team leadership, situation monitoring, mutual support, and communication.²⁷ Consistent with the expectations of the Team-STEPPS learning model which emphasizes teamwork and building communication,^{26,31} because this is very determining success in providing nursing care.³² And even more important is promoting a culture of patient safety.³³ Thus the Team-STEPPS-based preceptorship model can provide assurance to nursing students, that they have adequate organizational skills and clinical nursing practice.

In line with the results of this study, through the application of the Preceptorship model guidance based on Team-STEPPS, there was a significant increase in the skill domains Clinical Competency, Nursing Management, Technical Competency, Self-Management, Patient-oriented care, although technical competence was less prominent compared to other competencies.

Thus, the Team-STEPPS-based preceptorship guidance model is able to encourage students to be sensitive to patient safety culture, without leaving the knowledge, interpersonal skills, and clinical skills among team members. However, supervisors must also pay attention to nurse-client communication skills for each student, because this is an obstacle that must be anticipated immediately.³⁴ In addition, obstacles from the patient's perspective such as the comparison of the number of nurses and patients, the reluctance of nurses to communicate with patients, and the negative attitude of nurses towards patients, also need to be anticipated.³⁵ Thus communication skills are very important to support teamwork, and communication barriers need to be anticipated to increase teamwork because the benefits are also felt by nurses, which can increase nurse job satisfaction.³⁶

Meanwhile, Team Work in nursing management is used as a tool to improve patient efficiency and safety, make the workplace atmosphere more conducive, and increase work motivation,³⁷ as well as being a challenge in increasing accountability, conflict management, decision-making, progress reflection, and coaching.³⁸ The results of a systematic mixed-methods review study have also reported that overall Team Work can increase knowledge and skills, build more effective communication, increase trust in relationships, increase loyalty, feel comfortable at work, feel responsible, and foster awareness of team,³⁹ and for patients, the Team Work model of the nursing services they receive, they feel protected⁴⁰ This has an impact on patient satisfaction and safety because based on the results of this study, there has been an increase in performance in patient-oriented care and clinical skills, and the Team Work model in nursing services so that this overall has shown a facilitative service.⁴¹ However, in building a single work team, it is also necessary to pay attention to obstacles that might affect teamwork such as personality, gender, hierarchy, resource issues, knowledge of best practices for teamwork, psychology, existing rules, negative perceptions about the profession, shift schedule, and may be less used to teamwork.⁴²

In terms of student competence as a whole, the findings of this study have shown an increase after the guidance model with the Team-STEPPS-based preceptorship method was applied, which shows there are differences before and after guidance with this method. This is in line with the ultimate goal of the general learning process for students, that they must have professional skills, which shows the readiness of students to become prospective professional nurses in the future.⁴³ Even though they are nursing students, in the clinical environment, they must position themselves as professional nurses, and this becomes their challenge when they practice nursing in the clinical environment,⁴⁴ and thus they

have a lot to learn regarding the integration of experiential learning into clinical practice, or habits carried out in the clinical environment.⁴⁵

Limitations

The main limitation of this study is that the observation model carried out by researchers has a high value of subjectivity, but with a professional attitude shown by researchers, this value has high accuracy. Among the samples, they received different interventions, but these differences still met the elements of justice, because they also received the same guidance to improve their competence, only one group received guidance from senior nurses, and the other group received guidance from clinical instructors and academic lecturers. Another limitation is that there is no local and/or national research that can be compared with our findings because it is a research development of the Team-STEPPS-based preceptorship guidance model to increase student competency.

Conclusion

Because the guidance of the Preceptorship model is oriented towards clinical competence and self-management abilities and is lacking in the process of organizing health services for the competence of clinical nursing practice students, it is necessary to integrate the Team-STEPPS model into the preceptorship model as the basis for nursing practice guidance. Our study found that the application of the Team-STEPPS-based preceptorship guidance model was able to improve Clinical Competence, Nursing Management, Technical Competence, Self-Management, and Patient-oriented care so that nursing students have clinical nursing practice skills and skills in the process of organizing nursing services while undergoing clinical nursing practice at home. Sick. Thus the application of Team-STEPPS-based preceptorship model guidance needs to be applied to students when undergoing clinical nursing practice for now and in the future.

Data Sharing Statement

Data are available upon request. It is not in a repository state but is available on request from the lead author. It is de-identified. Author can be contacted on aahsanpsik.fk@ub.ac.id.

Ethics Approval

The research procedure complies with the Declaration of Helsinki and has been approved by the Ngudi Waluyo General Hospital Health Research Ethics Committee with number: No: 35/EA/KEPKI2022. Researchers have also received a research assignment letter from the Faculty of Medicine, Brawijaya University with the number:075/SP/Diklat/XI/2022. All participants were given informed consent and were told that they could withdraw themselves from at any time from the research.

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Author Contributions

All authors made a significant contribution to the work reported whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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The authors report no conflicts of interest in this work.

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