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The Effect of Nursing Residency Program on the Clinical Competency of Novice Nurses Working in the ICU & NICU from the Viewpoint of Head Nurses

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Received: 05 February 2018 **Revised:** 20 May 2018 **Accepted:** 17 August 2018

ARTICLE INFO

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Keywords:
Clinical competence,
Novice nurse,
Nursing residency program,
Head nurses

ABSTRACT

Background: The ultimate goal of nursing is to ensure the recovery and health of patients through providing high quality care. However, novice nurses who are working in clinical settings need help and are not aware of the system's expectations. In this study, we investigated the effect of a nursing residency program on the clinical competence of novice nurses working in the intensive care units of Yazd governmental hospitals from the viewpoint of head nurses.

Methods: In this interventional study, the clinical competence of 31 novice nurses was studied. The participants were randomly assigned into two groups of experimental and control. The nursing residency program consisted of 20 hours of training, support, and counseling in eight months for the experimental group. Data gathering tool in this study was a clinical competence questionnaire for novice nurses. The head nurses filled out the questionnaires before, immediately after, and three months after the training course. Data were then analyzed by SPSS (version 22) and running independent t-test, and repeated analysis of variance.

Results: According to the viewpoint of the head nurses, The clinical competence scores of novice nurses working in the ICUs & NICU, were (150.15 ± 23.1), (174.35 ± 2.75), and (168.3 ± 32.45) for the experimental group and (134.75 ± 24.75), (116.05 ± 29.7), and (146.3 ± 22) for the control group before, immediately after, and three months after the intervention, respectively. The difference between mean scores of two groups was not significant before the intervention and three months later, although of the mean scores of two groups differed significantly before the intervention and immediately after the intervention. With respect to clinical competence scores, the different between two groups was significant in three stages.

Conclusion: The results on the efficacy of nursing residency program in improving the clinical competence of novice nurses working in the ICUs & NICU were positive from the viewpoint of heads nurses. Accordingly, we propose execution of programs related to all issues over which nurses need to upgrade their clinical competencies and for the novice nurses of other parts of the hospital.

Introduction

The ultimate goal of nursing is to ensure the recovery and health of the patients by providing high quality care. However, novice nurses who are working in clinical settings need help and are not aware of the system's expectations. The managers are not aware of novice and inexperienced nurses' level of competence and this is considered as one of the major problems in the clinical environment.[1] Nevertheless, the number of novice nurses who take care of patients in hospitals, due to lack of nursing staff, is significant.[2] In order to respond appropriately to requests from the hospitalized patients, novice nurses must have enough knowledge and skills.[3] In a study on nursing professionalism criteria, Azimian et al. (2013) concluded that, new graduates lacked the necessary skills in logical thinking, time management, communication skills, and group work according to the viewpoint of nursing educators.[4] One of the important concepts emphasized in the nursing education system is clinical competence.[5] Clinical competence is a combination of ethics and values, which is reflected in a nurse's knowledge and skill. Honesty, care, communicational skills, and compatibility are recognized as the indications of individual competence.[6] Education-based competence is an evident and distinct term, but there is no agreement on the definition and measurement criteria of clinical competence.[7,8] In fact, competence is an abstract concept and situation in which incompetence is absent.[9] In 1984, Benner defined competence as the ability to perform the nursing duties along with the knowledge to achieve desirable results.[10] Motahhari et al. defined clinical competence as the contemplative and continuous use of the technical skills, knowledge, clinical reasoning, emotions, and values in clinical settings.[11] In other definitions and for all health care providers, competence is evaluated through safety care performed by the nurses and their beliefs.[12] The comprehensive concept of competence is the combination of general competencies, discipline knowledge, and professional performance.[13] According to Bagheri et al., existence of competence in nursing led to safe performance and high quality care services, which in turn resulted in patient satisfaction, professional development, and reduced health costs.[14] It should also be noted that patients admitted to ICUs & NICU have dysfunction in their vital organs and therefore simultaneous determination of the priorities, speed, and precision are crucial in performing the nursing care services. Consequently, the nurses working in these wards should have high clinical competence and be able to determine the priorities with the least amount of time.[15] To hit this target, they must have the power of critical thinking, creativity, competence, and analysis based on the problem-based learning and research capability.[16] The induction program implies training of the newly graduated nurses by providing the occupational and clinical information to be employed in the hospital setting.[17] The induction program is then considered as a mediating factor between the clinical competence and environment adaptation for novice nurses.[18]

Nowadays, no efficient, scientific, and up-to-date induction program exists for the novice nurses and in some cases qualification is not considered serious due to lack of working forces. Even in some cases, despite dissatisfaction of the head nurses about provision of work forces in the ICUs & NICU, novice nurses were employed in these wards. Even throughout Australia, no agreement exists on the standard of passing the transition process and induction programs for the nurses.[19]

A review by Edward et al. (2015) showed that the support strategies, regardless of the type of support, had useful effects in improving the process of transition from student life to professional life for both nurses and their managers.[20] Bridging this gap in the transitional phase is achieved by optimized

familiarization of the novice nurses to obtain clinical competence.[14,21] Therefore, common collaborations and plans between faculty departments and the clinical group of hospitals can reduce the existing gaps in academic education and clinical expectations.[22] Many studies were conducted on clinical competence, but most of them were based on nursing process. Clinical competence dimensions were also studied according to investigation, determination, planning, implementation, and evaluation of the nursing process stages.[23,24] In Iran, Motahari et al. (2008) investigated the clinical competence in five hospitals of Booshehr city and reported that the clinical competence of nurses were unfavorable in some areas such as education, guidance, and quality assurance.[11] Nursing instructors should further evaluate the effects of novice nurses' education on the patients' outcomes in order to assess the value of this program in the transitional phase.[25] Of course, it should be noted that training and supervision are important skills and nurses with responsibilities in departments are not necessarily always good educators to adopt this role.[26] Evidence suggests that novice nurses should be supported in the induction programs and throughout the transition phase.[27] However, more research is required to select the best evaluation methods for various dimensions of clinical competence.[10]

Considering the lack of nurses and the necessity to ensure the clinical competence of nurses working in ICUs & NICU, one of the suggestions is the implementation of nursing residency program that includes occupational, behavioral, supportive, and counseling training and practical classes. Some studies were conducted on the clinical competence of nurses or educational courses and their impact on clinical competence in Iran, although their approach was different from the current research. Moreover, we proposed a multilateral program in which education and support were integrated and nurses were not left unattended in this transition period; from student life to professional life. One of the evaluation factors in this realm is the effectiveness of the program from the viewpoint of supervisors and direct head nurses. So, we evaluated the effect of a nursing residency program on the clinical competence of nurses working in ICUs & NICU of hospitals affiliated to Shahid Sadoughi University of Medical Sciences in Yazd, Iran.

Materials and Methods

In this semi-experimental study, all of the undergraduate nurses working in ICU, PICU, CCU, transplantation, neurosurgery, dialysis, burn ICU, NICU, and emergency care units of Yazd Educational Hospitals for less than two years were included. The exclusion criteria included having non-continuous B.S degree in other fields such as anesthetist technician and paramedic diploma, as well as long-term leave such as maternity leave or part-time work in the ICU & NICU.

Data collection tool: In order to investigate the clinical competency, a two-part questionnaire was used, the first part of which was related to personal information (age and gender) and the second part was about the competency inventory for registered nurse (CIRN) developed by Lio et al. The Persian version of nurse's competency questionnaire was translated by Elham Ghasemi et al.[28] This questionnaire comprises of seven dimensions, including clinical care (10 items), leadership (9 items), interpersonal relationships (8 items), ethical and legal performance (8 items), professional development (6 items), coaching and training (6 items), the tendency toward conducting research, and critical thinking (8 items). The questionnaire's rating and interpreting method is based on a five-point Likert scale, so that zero means lack of competence (never), 1 almost lack of competence (rare), 2 moderate competence (sometimes), 3 more than moderate competence (often), and 4 indicates a high degree of competence (always).

In this study, the range of clinical competence score was 0-220. In this regard,

the total score within the range of 165-220 was considered as a high competence, a score in 110-165 showed moderate competence, and a total score of less than 110 indicated low competence. The Cronbach's alpha of the total Persian questionnaire is 0.967, 0.676 for the professional progress dimension, and 0.873 for the clinical care dimension.[28] The reliability of the questionnaire was also calculated and confirmed (0.93) in this study. Before starting the intervention, the researcher distributed the clinical competency questionnaire among the head nurses to evaluate the novice nurses and fill the forms. Then, the completed questionnaires were analyzed and the nurses with moderate (total score of 110-165) or poor (total score less than 110) competence scores were selected to participate in this study.

Three educational hospitals in Yazd, affiliated to Shahid Sadoughi University of Medical Sciences, were considered. Novice nurses of one hospital were regarded as the experimental group and those at the other hospitals were considered as the control group. At the first session, the lecturers explained the content of the program as well as the date and time of the classes for the the experimental group.

The researcher guided, supported, evaluated, and backed the novice learners and had a modeling and trusting role who answered the participants' questions throughout the study. From the beginning of the classes up to three-month after the intervention, which lasted eight months, the researcher was considered as a consultant and link between the faculty members and nurses.

Teachers used the learning methods based on simulation (role playing and learning skills), lectures, and problem-based teaching. At the end of the intervention, head nurses assessed the clinical competence of the novice nurses working in their ward using the clinical competence questionnaire. Three months later, in order to evaluate the effects of training, the clinical competence questionnaire was again completed by the head nurses. After collecting the data, results of clinical competency questionnaires were analyzed using SPSS (version 22) and running descriptive and inferential statistical tests.

Ethical considerations in this study included obtaining the permission from the Ethics Committee (IRCT code: 121678), obtaining permission from the hospital authorities, and obtaining written informed consents from the participants of the study, prior to the clinical study. We further considered confidentiality of information and the participants' willingness to start and continue their collaboration.

Results

In this study, after determining the clinical level, 60 novice nurses working in ICUs & NICU of hospitals as well as 32 nurses (19 controls and 17 test groups) with moderate and poor clinical competence were selected. Among this population, four participants of the experimental group were excluded since they were on maternity leave and had more than two sessions of absence, which in this case , the training and supportive program had to be administered for 13 participants of the experimental group. In our study, 25 (78.1%) novice nurses were female and seven (21.9%) were male. The highest relative frequency of female nurses was in the control group (73.7%), while this rate was 84.6 percent in the control group and the two groups were not significantly different in terms of gender (P = 0.671). The mean score of clinical competence in the first stage was 134.75± 24.75 for the control group and 150.15 ± 23.1 for the experimental group, which was not statistically significant (P = 0.081). The comparison of the mean scores of different dimensions of clinical competence in two groups before the intervention is shown in tables 1-4.

The mean of clinical competence scores was 116.05 ± 29.7 in the control group and 174.35 ± 2.75 in the experimental group immediately after the intervention, which was statistically significant (P = 0.001).

Table 1. Comparison of the mean scores of different aspects of clinical competence in two groups before the intervention

Clinical competence		Maximum score	Control group Mean ± SD	Experimental group Mean ± SD	P
From the viewpoint of head nurses	Clinical care	40	24.4 ± 5	28.4 ± 3.5	0.02
	Leadership	36	22.05 ± 4.29	24.3 ± 4.32	0.178
	Interpersonal relationships	32	19.28 ± 3.68	22.4 ± 3.68	0.026
	ethical and legal performance	32	20.4 ± 3.12	24.4 ± 3.52	0.002
	Professional progress	24	14.46 ± 2.82	15.6 ± 3.54	0.321
	Coaching and training	24	14.64 ± 2.94	14.64 ± 3.18	0.994
	Having tendency toward doing research and critical thinking	32	19.52 ± 3.44	20.64 ± 3.92	0.385
	Total	220	134.75 ± 24.75	150.15 ± 23.1	0.081

The comparison of the clinical competence mean scores in different dimensions after intervention for the two groups is represented table 2. Results showed significant differences in all dimensions in two groups.

In the third stage, the mean of clinical competence scores was 146.3 ± 22 for the control group and 168.3 ± 32.45 for the experimental group; however, the difference between two groups was not statistically significant (P = 0.032). Comparison of the mean scores of different dimensions of clinical competence in two groups three months after the intervention is indicated in table 3. Results showed significant differences in some dimensions.

According to table 3, the trend of changes in the control group was not significant but in the experimental group it was significant (p-value < 0.001).

Discussion

In the current study, we examined the effect of nursing residency program on the clinical competence of novice nurses. Based on the findings, before the intervention, the nurses' clinical competence scores from the viewpoint of head nurses were moderate in both the control (134.75 ± 24.75) and the experimental (150.15 ± 23.1) groups. No significant statistical difference was observed between the clinical competence scores of the two groups. Prior to the intervention, the clinical competence of the novice nurses from the viewpoint of head nurses was moderate for the clinical care dimension but it was week for the other dimensions, including leadership, interpersonal relationships, ethical and legal performance, professional development, coaching, and education, tendency to research and critical thinking. It seems that novice nurses were more trained in the clinical care dimension than in the other clinical competence dimensions; so, they need more education in other areas, which was also confirmed by the head nurses in this study.

Table 2. Comparison of the mean scores of different aspects of clinical competence in two groups after the intervention

clinical competence		Maximum score	Control group Mean ± SD	Experimental group Mean ± SD	P
From the viewpoint of head nurses	Clinical care	40	20 ± 5.8	32.8 ± 1.6	< 0.001
	Leadership	36	17.82 ± 5.4	27.99 ± 0.99	< 0.001
	Interpersonal relationships	32	16.08 ± 4.48	25.36 ± 1.6	< 0.001
	ethical and legal performance	32	19.2 ± 3.84	26.56 ± 1.12	< 0.001
	Professional progress	24	13.26 ± 3.54	18.96 ± 0.42	< 0.001
	Coaching and training	24	12.78 ± 2.82	18.18 ± 0.72	< 0.001
	Having tendency toward doing research and critical thinking	32	17.04 ± 4.72	24.56 ± 0.72	< 0.001
	Total	220	116.05 ± 29.7	174.35 ± 2.75	< 0.001

Table 3. Comparison of the mean scores of different aspects of clinical competence in two groups three months after the intervention

Clinical competence		Maximum score	Control group	Experimental group	P
			Mean ± SD	Mean ± SD	
From the viewpoint of head nurses	Clinical care	40	26.2 ± 4.8	30.9 ± 6	0.022
	Leadership	36	23.4 ± 4.14	27.9 ± 5.31	0.014
	Interpersonal relationships	32	21.12 ± 3.04	25.12 ± 3.92	0.003
	ethical and legal performance	32	22.8 ± 2.24	26.72 ± 4	0.005
	Professional progress	24	15.4 ± 2.52	17.46 ± 4.44	0.110
	Coaching and training	24	16.2 ± 2.28	17.04 ± 4.44	0.531
	Having tendency toward doing research and critical thinking	32	21.8 ± 3.92	23.2 ± 5.84	0.278
	Total	220	146.3 ± 22	168.3 ± 32.45	0.032

In the present study, the head nurses assessed the clinical competency level of novice nurses immediately after the intervention and found that it was poor for the control group, but high for the experimental group. The difference between the scores of the two groups considering clinical competence was significant. According to head nurses and regarding the dimensions of clinical care, interpersonal relationships, ethical and legal performance, professional development, coaching and education, tendency to research, and critical thinking, the control group was at the moderate level but the experimental group was at the high level and the difference between the two groups was significant. In general, after the intervention, head nurses found that the clinical competence level was moderate in the control group and high in the experimental group, which showed a significant difference. Therefore, based on our results, the nursing residency program led to improvement of clinical competence in the novice nurses and this change was evident in all dimensions. Trepanier (2012) regarded the support program as an experienced trainer for the novice nurses that included direct teaching and clinical work, experiencing different wards, and conducting emotional expression sessions. Trepanier believed that coaching and counseling helped the transition phase from the student to occupational life.[29]

Verret and Lin (2016) reported that the presence of a trainer in novice nurses' education programs and facilitate stronger relationships among employees.[30] Wilgis and McConnell (2008) investigated the conceptual map as an educational strategy for improving nurses' critical thinking skills during an introduction program. They studied 14 novice nurses and concluded that participants' scores improved from 14.071 to 16.428 during the program.[31]

Previous studies showed that the induction programs varied in terms of content and length of course in different treatment centers.

Table 4. The trend of changes in the total score mean of clinical competency announced by head nurses in two groups

Group	Before the intervention	Immediately after the intervention	Three months after the intervention	P
	Mean ± SD	Mean ± SD	Mean ± SD	
Control	134.75 ± 24.75	116.05 ± 29.7	146.3 ± 22	0.002
Experimental	150.15 ± 23.1	174.35 ± 2.75	168.3 ± 32.45	0.03
Total	141.35 ± 24.75	139.7 ± 36.85	155.1 ± 28.6	0.041
P	0.081	< 0.001	0.032	

Repeated measures test & Independent T test

Edwards et al. (2015) found that supporting strategies had beneficial effects on the transition of nurses from the non-professional to professional life. Of course, in most studies, regardless of the type of support, these programs had a positive overall effect, but future studies with good designs are necessary for reliable and valuable results.[20] Rush et al. (2013) concluded that the presence of an appropriate program for novice nurses could improve skills.[32] In a study by Beyea
et al. (2010), the results showed that the simulation and support programs for novice nurses provided an environment for assessing the competence and recognition of educational needs.[33] Henderson et al. (2015) and Baldwin et al. (2016) concluded that the major problems of novice nurses in the first year were related to communication with patients and staffs as well as their lack of staff support. In this regard, induction programs and support of experienced staffs may be effective for nurses' roles.[34] In most studies, this program was a combination of classes and workshops, with both general and specialized lessons, along with learning opportunities, discussions, and scenarios. The following topics are presented and discussed in this program: nursing process, critical thinking, professionalization, communication skills, ethical and legal issues, and conflict management.

In general, the trend of changes in clinical competence scores of the control group from the viewpoint of head nurses showed that the scores were moderate and statistically significant. In other words, immediately after the intervention, the scores in the control group decreased significantly. Moreover, the difference in the experimental group was also significant. It is thus noteworthy that in the experimental group, the clinical competency scores immediately after the intervention were higher than the scores obtained three months later. It should also be mentioned that the control and experimental groups were in different hospitals and not exposed to each other. In a nutshell, we can conclude that the novice nurses have higher eagerness to implement their leanings at the beginning of their graduation, but sometimes later their eagerness reduce due to the working shifts, involving in the working environment, and the impact of colleagues.

It seems that head nurses gave lower scores to the clinical competence of the novice nurses of the control group immediately after the intervention than before the intervention. This finding can be due to high expectations of head nurses from the novice nurses after the intervention. However, three months after the intervention, when the novice nurses improved their skills and clinical competencies during work, head nurses rated them better. Meanwhile, the head nurses observed significant changes in the clinical competence of the experimental group and considered higher scores for then, but over time, the effect of these changes was dimmed. So, the head nurses revised the scores and gave lower scores to the clinical competence of their novice nurses.

Conclusion

In this study, the novice nurses working in ICUs & NICU of both control and experimental groups experienced positive changes in their clinical competence, which was expected due to the initial in-service training in the control group and the impact of colleagues. However, this research showed that the trend of changes for the mean of clinical competence scores, from the viewpoint of head nurses, was different and statistically significant between the experimental and control groups. In general, we suggest further studies to examine the actual efficacy of this program.

Limitations: Among the study constraints, we can mention the small number of samples that determines the need for more extensive studies in several centers. In addition, evaluation of the intervention in a longer time was not possible due to time constraints.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

The researchers announce their gratitude to Yazd Shahid Sadoughi University of Medical Sciences staff for financial support and cooperation in the implementation of the research.

How to Cite: Monshizade A, Nasiriani K, Khodayarian M, Shakerfar H. The Effect of Nursing Residency Program on the Clinical Competency of Novice Nurses Working in the ICU & NICU from the Viewpoint of Head Nurses. World J Peri & Neonatol 2019; 2(1): 28-36.

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