Research Article /Araştırma

Yenidoğan yoğun bakım ünitelerinde hemşirelerin performansı üzerinde palyatif bakım eğitiminin etkisinin değerlendirilmesi

*Evaluation of the impact of palliative care training on nurses' performance in neonatal intensive care units**

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ABSTRACT

Aim: Palliative care plays a crucial role in improving the quality of life for patients and their families, particularly in sensitive areas like neonatal intensive care units (NICUs), where specialized and precise care is required. Enhancing the performance of nurses in providing palliative care can lead to better treatment outcomes and reduced family stress. This study aimed to evaluate the impact of palliative care training on nurses' performance in NICUs. This study was conducted with the aim of determining the impact of palliative care training on the performance of nurses in the neonatal intensive care unit.

Material and Methods: In this clinical trial, nurses from Shahid Sadoughi and Afshar hospitals were randomly divided into two groups of 30 people (intervention and control). Demographic data, including the age and work experience of the nurses, were recorded in the relevant form. The performance score of nurses in palliative care was determined with a checklist made by the researcher before the training, immediately after the training, two weeks and four weeks after the training. And it was evaluated using SPSS version 25 software and statistical tests of pairs and independent t, chi-square and analysis of variance with repeated measurements.

Results: The average performance score of the nurses in the intervention group, two weeks and four weeks after training, was significantly higher than the control group (P<0.001). Additionally, in the intervention group, the performance score after the intervention at all times compared to before the intervention increased significantly (P<0.001), whereas no significant changes were observed in the control group.

Conclusion: Palliative care training can significantly improve nurses' performance in NICUs. These findings underscore the importance of planning and implementing regular training programs for nurses to enhance the quality of palliative care in sensitive areas.

ÖZ

Amaç: Palyatif bakım, özellikle hassas alanlar olan yenidoğan yoğun bakım ünitelerinde (YYBÜ) hastaların ve ailelerinin yaşam kalitesini artırmada kritik bir rol oynamaktadır. Hemşirelerin palyatif bakım sağlama konusundaki performanslarının artırılması, daha iyi tedavi sonuçları ve aile üzerindeki stresin azalması ile sonuçlanabilir. Bu çalışma, palyatif bakım eğitiminin YYBÜ'de görev yapan hemşirelerin performansı üzerindeki etkisini değerlendirmeyi amaçlamaktadır.

Gereç ve Yöntem: Bu klinik çalışmada, Şehit Sadoughi ve Afshar hastanelerinde görev yapan hemşireler rastgele şekilde 30'ar kişilik iki gruba (müdahale ve kontrol) ayrıldı. Hemşirelerin yaş ve mesleki deneyim gibi demografik verileri ilgili forma kaydedildi. Hemşirelerin palyatif bakım konusundaki performans puanları, araştırmacı tarafından oluşturulan kontrol listesi ile eğitim öncesinde, eğitimden hemen sonra, iki hafta ve dört hafta sonra belirlendi. Veriler SPSS 25 yazılımı kullanılarak çiftli ve bağımsız t-testi, ki-kare testi ve tekrarlı ölçümlerle varyans analizi ile değerlendirildi.

Bulgular: Müdahale grubundaki hemşirelerin eğitimden iki ve dört hafta sonra elde ettikleri ortalama performans puanları, kontrol grubuna kıyasla anlamlı düzeyde daha yüksekti (P<0.001). Ayrıca, müdahale grubunda eğitim sonrası tüm zaman noktalarında performans puanları, eğitim öncesine göre anlamlı düzeyde arttı (P<0.001). Buna karşılık, kontrol grubunda anlamlı bir değişiklik gözlenmedi.

Sonuç: Palyatif bakım eğitimi, YYBÜ'de çalışan hemşirelerin performansını anlamlı şekilde artırabilir. Bu bulgular, palyatif bakımın kalitesini artırmak amacıyla hemşirelere yönelik düzenli eğitim programlarının planlanması ve uygulanmasının önemini vurgulamaktadır.

INTRODUCTION

The neonatal phase is a critical period as infants transition from fetal intrauterine life to preterm extrauterine existence, requiring numerous physiological adaptations. Despite recent technological advancements in neonatology, this phase remains vulnerable compared to other pediatric age groups, with the highest risk of mortality (1). Such reports highlight significant issues regarding global infant mortality in 2019, with 2.4 million babies dying, accounting for almost 40% of all child deaths worldwide (1, 2). The rapid pace underscores the importance for neonatal care workers to address not only the infants' physiological needs but also their emotional well-being, particularly in cases where a cure is not possible. In Iran, considerable efforts have been made to reduce neonatal mortality, with a focus on providing intensive care to save infants' lives at any cost in neonatal intensive care units (NICUs)(3). However, this emphasis often results in the neglect of end-of-life care for neonates, including palliative and essential support services, by both healthcare providers and society at large(4). According to WHO, palliative care is an approach intended to provide comprehensive care for the patient's physical, mental, and spiritual needs and support the relatives(5). With a focus on pain management as end-of-life care and maintenance of ailment, its mission is to minimize suffering while improving the quality of life for sick infants(6).

The introduction of palliative care in neonatal settings can be traced back to the 1980s in the United States, where it was initially applied to infants and young children (7). Carter and Catlin (8) developed the first coordinated neonatal palliative care program in 2000, which has since gained recognition worldwide.

The growing integration of palliative care into NICU practices is supported by international organizations, such as the World Health Organization and the International Children's Palliative Care Network (ICPCN), which have established guidelines and resources to facilitate its implementation(6, 9). Despite these advancements, the application of neonatal palliative care in Iran remains limited, hindered by various barriers, including insufficient training, cultural and religious beliefs, and organizational challenges (10, 11).

Nurses play a pivotal role in the delivery of palliative care within the NICU, given their close interaction with both neonates and their families. They are integral in implementing care plans that alleviate suffering and enhance the quality of life for these vulnerable patients(5). However, inadequate training and lack of competency among nurses are significant barriers to effective palliative care delivery(2, 7, 12). Studies have shown that a lack of formal education and clinical guidelines impedes nurses' ability to provide high-quality palliative care, leading to unmet needs for both neonates and their families (13).

The current gaps in healthcare necessitate specific educational programs for NICU nurses. Nurses should be equipped with the skills necessary to enhance their self-confidence and knowledge in providing palliative care, leading to positive outcomes for patients(2). Despite the urgent need for these programs in Iran, there have been few studies on how they impact nursing performance, particularly within the Yazd city area.

This study aims to assess the impact of palliative care education on the performance of NICU nurses. Through evidence-based

educational interventions, the research aims to address the current gaps in palliative care delivery. It aims to provide practical strategies and guidelines for nurses to enhance their practice. The anticipated findings of this study are poised to make a significant contribution to the field of neonatal care by promoting the integration of palliative care principles into routine nursing practice. Ultimately, the study aims to improve the overall quality of life for neonates and their families.

MATERIAL AND METHODS

Study Design

This randomized clinical trial was conducted to evaluate the impact of palliative care training on the performance of nurses working in the neonatal intensive care units (NICUs) of Shahid Sadoughi and Afshar Hospitals in Yazd, Iran. The study was registered in the Iranian Registry of Clinical Trials (IRCT20231129060224N1). Participants were randomly assigned to either the intervention or control group, and their performance was assessed across four time points: baseline (pre-intervention), immediate post-intervention, two weeks post-intervention, and four weeks post-intervention. The performance was measured using a standardized checklist, enabling a rigorous two-group, four-stage design.

Study Setting and Duration

The study was conducted in the NICUs of Shahid Sadoughi and Afshar Hospitals in Yazd. This timeframe allowed for the comprehensive implementation of the training program and subsequent follow-up assessments.

Study Population

The study population comprised all nurses working in the NICUs of Shahid Sadoughi and Afshar Hospitals during the study period.

Inclusion Criteria

• A minimum of six months of experience in the NICU.

• A bachelor's degree or higher in nursing.

• Informed consent to participate in the study.

Exclusion Criteria

• Previous participation in palliative care training.

• Withdrawal from the study due to unforeseen circumstances or psychological distress reported by the participant.

Sample Size and Randomization

Considering a significance level of 5% and a statistical power of 90%, and based on a previous similar study showing a 90% performance in the intervention group compared to 50% in the control group, the required sample size was estimated to be 24 participants per group. Accounting for a 10% dropout rate, this number increased to 26 per group. However, to ensure greater accuracy and in consultation with a statistics advisor, 32 participants were ultimately selected for each group through random sampling.

$$n = \frac{(Z_{(1-\frac{\alpha}{2})} + Z_{1-\beta})^2 [P_A(1-P_A) + P_B(1-P_B)]}{(P_A - P_B)^2}$$

Intervention

The intervention consisted of a structured, six-hour palliative care training workshop, designed in collaboration with subject matter experts. The training was divided into theoretical and practical components:

1. **Theoretical Component**: This included the definition of palliative care, its benefits, principles, philosophy, and the role of the nurse in providing palliative care.

2. **Practical Component**: Focused on pain management, comfort measures, symptom management, therapeutic ventilation, oxygen therapy, nutrition, and family support.

To facilitate participation, nurses were divided into three groups, each receiving the training on separate days. The workshop utilized lectures, brainstorming sessions, discussions, and multimedia presentations to ensure comprehensive understanding and skill development.

Data Collection

Data were collected using a demographic information form and a performance checklist adapted from the work of Amal Gharib Sabagh. The performance of nurses in both groups was evaluated by trained research assistants who were blinded to group assignments. Assessments were conducted at four intervals: pre-intervention, immediately post-intervention, two weeks post-intervention, and four weeks post-intervention, during various shifts (morning, afternoon, and night) for 15–20 minutes per session.

Reliability and Validity of Instruments

The performance checklist was reviewed by ten faculty members from the School of Nursing and Midwifery at Yazd University of Medical Sciences to ensure content validity. Reliability was assessed using inter-rater reliability, with two independent raters evaluating three neonatal patients (not included in the study sample) simultaneously. The intraclass correlation coefficient (ICC) for the palliative care performance score was calculated at 0.8, indicating high agreement between raters.

Ethical Considerations

The study protocol was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences. Written informed consent was obtained from all participants prior to enrollment. All data were anonymized and confidentiality was maintained throughout the study.

Statistical Analysis

Data were analyzed using SPSS software version 26.0. Descriptive statistics were used to summarize demographic characteristics. Repeated measures ANOVA was employed to compare performance scores between and within groups across the four-time points. The level of significance was set at $p < 0.05$.

This structured methodology ensures the study's rigor and adherence to ethical standards, enabling a thorough evaluation of the impact of palliative care training on the performance of NICU nurses.

RESULTS

This study was a randomized clinical trial to evaluate the impact of palliative care training on the performance of neonatal intensive care unit (NICU) nurses at Shahid Sadoughi and Afshar hospitals. Sixty nurses who met the inclusion criteria were enrolled and randomized into intervention and control groups (30 nurses each) after providing written informed consent.

Table 1. Comparison of age and work experience between intervention and control groups

Variable	Intervention (n = 30)	Control (n = 30)	Independent t-test (P-value)
Age (Mean ± S.D)	33.27 ± 7.74	36.03 ± 7.48	0.165
Work Experience (Mean ± S.D)	9.40 ± 7.02	12.03 ± 6.94	0.150

Table 2. Distribution of demographic and clinical characteristics in intervention and control groups

Variable	Intervention (n = 30)	Control (n = 30)	Chi-square (P-value)
Employment Status			0.227
Official	10 (33.3%)	16 (53.3%)	
Contractual	10 (33.3%)	8 (26.7%)	
Temporary	1 (3.3%)	2 (6.7%)	
Project-based	4 (13.3%)	4 (13.3%)	
Education Level			1.000
Variable	Intervention (n = 30)	Control (n = 30)	Chi-square (P-value)
Bachelor's Degree	26 (86.7%)	26 (86.7%)	
Master's Degree	4 (13.3%)	4 (13.3%)	
Hospital Location			0.573
Afshar	10 (33.3%)	8 (26.7%)	
Sadoughi	20 (66.7%)	22 (73.3%)	
Palliative Care Experience			------
Yes	30 (100%)	30 (100%)	
No	0 (0%)	0 (0%)	
Prior Palliative Care Training			------
Yes	0 (0%)	0 (0%)	
No	30 (100%)	30 (100%)	

Demographic Characteristics

Table 1 presents the demographic characteristics, including the mean age and work experience of nurses in both groups. The mean age in the intervention group was 33.27 ± 7.74 years, compared to 36.03 ± 7.48 years in the control group. There was no significant difference between the two groups regarding age (P = 0.165). Similarly, the mean work experience was higher in the control group but not significantly different between the two groups (P > 0.05).

Comparison of Demographic Variables

Table 2 compares the distribution of employment status, education level, hospital location, palliative care experience, and previous palliative care training between the two groups. The distribution of educational levels between the intervention and control groups was statistically similar (P = 1.000). The two groups had no significant differences in employment status and hospital location (P > 0.05). All nurses had experience in palliative care, and none had prior palliative care training.

Performance Scores Analysis

The normality of performance scores was assessed using the Kolmogorov-Smirnov test, confirming a normal distribution across different time points (P > 0.05). Therefore, parametric tests were employed for both inter-group and intra-group comparisons.

Table 3. Comparison of mean performance scores across different time points

Time Point	Intervention (n = 30)	Control (n = 30)	Independent t-test (P-value)
Pre-Intervention Score	27.25 ± 3.29	24.07 ± 4.23	0.225
Immediate Post-Intervention Score	30.43 ± 3.96	23.37 ± 3.25	0.001
Two Weeks Post-Intervention Score	32.10 ± 2.71	23.43 ± 3.23	0.001
Four Weeks Post-Intervention Score	31.07 ± 2.90	23.27 ± 3.16	0.001

Table 4. Repeated measures Anova results for performance scores over time

Effect	F-value	P-value
Time Effect on Performance Scores	1371.2	0.001
Interaction Between Time and Group	0.34	0.001
Overall Group Comparison Across Time	57.8	0.001

Table 3 shows the comparison of performance scores at various time points between the intervention and control groups. Pre-intervention performance scores were similar in both groups (P > 0.05). However, immediately post-intervention, and at two and four weeks post-intervention, the intervention group showed significantly higher performance scores compared to the control group (P = 0.001), with a minimum difference of 7 points. Within-group comparisons in the intervention group showed a significant increase in performance scores at all time points post-intervention compared to baseline (P = 0.001). No significant changes were observed in the control group over time (P > 0.05).

Intra-group comparisons:

Intervention Group: Significant improvement in performance scores was observed from pre-intervention to each subsequent time point (P = 0.001).Control Group: No significant changes in performance scores across time points (P > 0.05).

Repeated Measures Analysis

Repeated measures ANOVA was used to evaluate the effect of time on performance scores and the interaction between time and group (Table 4). The results showed a significant effect of time on performance scores (P = 0.001), a significant interaction between time and group (P = 0.001), and a significant difference in overall performance scores between the two groups across all time points (P = 0.001).

As illustrated in Figure 1, the intervention group showed a significant upward trend in performance scores over time (P < 0.001). The interaction effect indicates that the change in performance scores differed significantly between the intervention and control groups across the different time points (P < 0.001). The intervention group consistently outperformed the control group in all measured periods (P < 0.001).
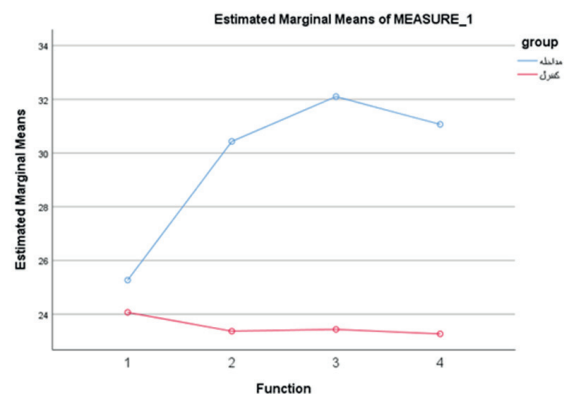

Figure 1. The trend of performance scores over time in intervention and control groups

DISCUSSION

The results of the study showed that the mean performance score of nurses immediately after training in the intervention group increased significantly. This finding is consistent with the study by Dehghani et al., which indicated the positive effect of specialized training on improving nurses' performance and self-efficacy (12). In Sabagh's study, the training provided to nurses in neonatal palliative care resulted in a significant increase in their attitude and performance, which is similar to the findings of the present study (5). Furthermore, Artioli et al. showed in their research that continuous training significantly improves the quality of palliative care, and these effects are sustained, which supports the immediate impact observed after training in this study (14).

The results two weeks after training show that the improvement in nurses' performance in the training group remains significant, although there may be a slight reduction

in the intensity of this improvement. These findings align with those of Hammond et al. (15) and Thavaraj et al. (16). Hammond et al. (15) examined the effects of training over time and demonstrated that the education provided had a lasting impact on the competence and performance of healthcare professionals. Thavaraj et al. also showed in their systematic review that well-designed educational programs with ongoing follow-up have a significant positive effect on nurses' performance and can help improve the long-term quality of care (16).

The results four weeks after training indicate that the improvement in nurses' performance in the training group continues, although a slight decrease in the level of improvement may be observed. This finding is similar to the studies of Twamley et al. (17) and Kim et al. (18). Twamley et al. (17) demonstrated that continuous education can contribute to sustainable improvement in knowledge and attitudes, confirming the need for ongoing educational programs. Kim et al. (18) also examined the impact of simulation-based training on nurses' clinical skills and concluded that repeated training can help enhance nurses' practical skills and performance.

The examination of the trend in mean performance scores of nurses at three different times showed that while performance improvement immediately after training significantly increased, this improvement may change over time. In line with these results, Peng et al. emphasized the need for ongoing education to meet the educational needs of nurses (2), and Shahintab et al. also showed poor performance of nurses in palliative care and the necessity of training in this field, confirming the positive impact of educational interventions on nurses' performance improvement (19).

Other studies also refer to the impact of educational interventions on improving nurses' performance. Abuhammad et al. examined the effect of educational interventions on improving nurses' knowledge and attitude toward palliative care and concluded that effective educational programs benefit nurses' attitudes and performance (20). Conversely, some studies reported inconsistent and challenging results. For example, Desalu et al. investigated the effect of short-term training on nurses' clinical skills. They reported that short-term training effects are positive but their sustained effects are significantly limited. The reason for this inconsistency may include the lack of continuity in training or the limitations of short-term courses affecting long-term outcomes (21). Also, Ostadhasanloo et al. examined the effect of specialized training on nurses' clinical skills and found that while short-term effects are positive, the long-term effects significantly decrease. They pointed to potential weaknesses in the design and implementation of educational programs and emphasized the need for continuous optimization. The inconsistency in their study may be due to a mismatch between educational programs and actual clinical needs and lack of support after the training period in their methodology (22).

CONCLUSION

Palliative care training has been shown to notably enhance the performance of NICU nurses, leading to improved care quality and patient outcomes. Incorporating this training into professional development can result in more effective management of complex clinical situations and reduced stress for families. It is important for further research to delve into the long-term effects and wider implementation of these programs.

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