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# Quality of Nursing Services Provided at Neonatal Intensive Care Units (NICUs) at Governmental Hospitals in the Gaza Strip, Palestine

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## Abstract

**Objective:** The overall aim of this study is to assess the quality of nursing care provided to neonate infants in neonatal intensive care units (NICUs) in governmental hospitals in the Gaza Strip.

**Method:** We followed a quantitative, descriptive cross-sectional design. This study was carried out in NICU units at Shifa Medical Complex (SMC), Nasr Pediatric Hospital (NPH), Al-Aqsa Hospital (AH), Nasser Medical Complex (NMC), El-Emaraty Hospital (EH) and the European Gaza Hospital (EGH). Data were collected from a sample of nurses (N=110) using a self-administered questionnaire that includes 8 domains that assess the quality of nursing care. A questionnaire was constructed and data was collected by the researchers through a face to face interview with nurses.

**Findings:** The results showed that the total quality of nursing care in NICUs was 75.8%. The highest concepts associated with quality of nursing care on infection and inflammation 78.6% and the lowest on professional issues in NICU nursing 73.6%. Furthermore, there was statistically significant difference between in the average of ethics and quality of nursing care. According to educational level, where the quality of nursing care of participants with a diploma is lower than those with bachelors and master's degrees. In contrast, there wasn't statistically significant difference according to nurse's age in NICUs.

**Conclusion and recommendations:** This study revealed the presence of gap in the quality of nursing care. There was existing knowledge gap in key areas of professional issues in NICU and pain and stress. The main recommendations were suggested that there need more focus on educational and training programs about main issues such as: pain management, and improve practices in neonates' care. documented policy and procedure manuals were also recommended for assuring maintained quality care at the NICU.

**Keywords:** Quality; Nursing services; Gaza hospitals; Neonatal intensive care unit

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## Introduction

The Neonatal Intensive Care Unit (NICU) constitutes a therapeutic environment appropriate for the treatment of the newborn (NB) in a serious condition. The fragility of these NBs, the increasing implementation of high-risk procedures and the low tolerance to medication errors are some of the concerns of nursing professionals working in the NICU [1]. The infant mortality

rate among Palestine refugees was 18.2 per 1000 live births; 17.1 in the West Bank and 19.6 in Gaza Strip [2]. This reflected significantly increase in neonatal mortality from 12 per 1000 live births in 2008 to 20.3 per 1000 live births in 2013 [3]. Also, two-thirds of neonates deaths occurred within the neonatal period, mostly during the first few days of life [4].

The nurse is responsible for implementing care that valorizes the

physical, mental and social development of the NB [5]. Assessing the quality of services provided by nurses is crucial and, therefore, nurses are challenged to maintain and improve their quality of care [6]. Therefore, to build an image and maintain competitive advantages, successful organizations recognize the significance of continuously delivering quality services [7]. According to World Health Organization (WHO), detailed quality of care protocols and "job aids" for almost every aspect of care have improved quality and also shifted more care to the responsibility of skilled neonatal nurses, particularly concerning addressing infection prevention, feeding support, use of intravenous fluids, and safe oxygen use with careful tracking of oxygen saturation levels and follow-up services [4].

NICUs are important units to maintain the health of newborns in hospitals. The movement for quality in health services is today a need incorporated into the management of various interrelated areas [8]. This ensures safe service with excellence. In this perspective ensuring healthcare quality is understood as a multiprofessional task. Indeed, it is widely known that healthcare quality is not achieved through professional nursing practices alone. Moreover, professional nursing practice cannot be underappreciated or made invisible in the efforts to achieve healthcare quality [9].

As essential references for nurses' performance, they provide parameters for service quality assessment. In agreement with some authors, service quality below the standard level is considered contrary to the knowledge developed in nursing care practices and the theoretical framework of nursing [10]. Various approaches to quality assessment and quality improvement of NICU services have been proposed over time. From various approaches, many of them focus on the availability of essential infrastructure, equipment, written procedures and treatment protocols. Evidence shows that even when all the necessary structural components are available, the quality of care may still be poor unless appropriate use of available resources to ensure effective case management [9-11]. In this context, the international council of nursing attempt to define quality standards for nursing care, presented six categories of descriptive statements: patient satisfaction; health promotion; prevention of complications; well-being and self-care; functional readaptation and nursing care organization. Aiming to explain the nature and the different aspects of social mandates in nursing, the descriptive statements are, for patients, the assurance of quality nursing care, and for nurses they are a common reference and guide for professional practice performed with excellence [9].

The findings and recommendations of this study could add value to nursing profession globally and in Palestine partially in following areas: in practice, this study could provide suggestions to hospital policy makers to improve practices and management of neonates. Also, it could help in improve quality of nursing services. In education field, study will serve as the basis for review of neonatology curriculum in pre-services and in-service trainings in medical and nursing education. In research field, this study could build body of knowledge based of many researches, and may inspire for further researches. Also, in nursing care, this

study may provide a way of proper compliance of neonatal care protocol in neonatal units, these issues will improve rates of neonatal morbidity and mortality.

With the progress and validation of an instrument to determine the nurses' perception of the activities that contribute to nursing care quality, it was admitted that it is "possible to collect data and transform them into essential information for effective management and make the nursing team aware of the need to improve the services provided [12]. When performing the literature review in many of countries such as: Brazil and Portugal [13] the investigations related to the quality of nursing care were found to be limited, which justifies the development of this study. In agreement with some authors were include Natalia Eiro Yuri and Daisy Maria Rizatto Tronchin, it was believed that it was very important to obtain data related to the perception of nurses involved in the provision of nursing care. Programs and actions to improve quality require changes in services and depend largely on the commitment and dedication of nursing professionals [14]. The availability of information regarding the quality of nursing care provided in NICUs is insufficient. Therefore, the study aimed to assess the quality of nursing services provided at NICUs at governmental hospitals in Gaza Strip.

## Materials and Methods

### Study design

The study adopted the quantitative, descriptive cross-sectional design.

### Study population

The target population of the study consisted of all the nurses were working in the NICUs of governmental hospitals (Shifa Medical Complex, Nasr Pediatric Hospital, Al-Aqsa Hospital, Nasser Medical Complex, El-Emaraty Hospital and the European Gaza Hospital) in Gaza Strip during the period of data collection, it consisted of 220 nurses who are employee as full time and have experience more than two years.

### Study setting

This research carried out at main six NICUs in different Governorates of the Gaza Strip were including Al Shifa Medical Complex (SMC), Nasr Pediatric Hospital (NPH), Al-Aqsa Hospital (AH), Nasser Medical Complex (NMC), El-Emaraty Hospital (EH) and the European Gaza Hospital (EGH).

### Period of the study

Data collection started in May 2019 and continued until mid-July 2019. Data entry, analysis and writing the final report continue to September 2019.

### Sample and sampling

The study population was 220 nurses in six hospitals. Fifty percent of the those nurses were recruited to the study by simple random method according to their distribution in six governmental hospitals and have the eligibility criteria. The sample consist of 110 nurses who are working in NICUs in governmental hospitals

as following; 30 from Shifa Medical Complex (SMC), 23 from Nasr Pediatric Hospital (NPH), 21 from Nasser hospital, 13 from Al-Aqsa Hospital (AH), 14 from European Gaza Hospital (EGH) and 9 from El-Emaraty Hospital (EH).

### Eligibility criteria

Participants of this study were chosen according to the inclusion criteria. It include all the nurses who are working in NICUs in governmental hospitals, who are employees as full time and have experience more than two years.

### Instrument of the study

Forty one items structured interviewer questionnaire was constructed by the researchers after reviewing by a scientific committee in our country. The questionnaire included two parts, the first part was allocated to collect information regarding socio-demographic characteristics of the participant nurses, it included sex, age, address, the hospital, educational level, experiences in NICU by years and occupation "practical nurse, registration nurse or supervisor nurse", where the second part was allocated to gather information about quality of nursing care. It consist of forty one items classifies and eight domains. The domains are pain and stress domain, family-centered care domain, infection and inflammation domain, clinical nursing care practice domain, quality and safety domain, respiratory and ventilation domain, ethics domain, and professional issues in NICU nursing domain.

### Validity and reliability

Content validity was included 7 experts. The comments of experts were considered and modifications needed to be were done accordingly. The internal consistency reliability was statistically computed and Cronbach's alpha was over 0.7 which is acceptable value for the reliability of the tool.

### Data collection

Data were collected by the researchers through face to face an interviewed questionnaire with nurses who work in NICUs in the selected six governmental hospitals. A consent form was added in front of each questionnaire and ask the participants nurses to freely participate in the study. The average time for filling the questionnaire was 15-20 minutes.

### Data management and data analysis

The collected data were entered into the computer software "Statistical Package for Social Sciences" SPSS program version 20 and analyzed after coding of the questions and then cleaning of the entered data. Numerical data were expressed as means and standard deviations. Qualitative data such as: gender, educational level and local of residence were expressed as frequency and percentage. The ANOVA was used for examining for significance at level (0.05).

### Ethical considerations

A permission was obtained from the Ministry of Health to conduct the study at the governmental hospitals. Also a consent form was requested and signed by each participant which

indicated that the participation was voluntary and to emphasize the confidentiality of the information and the right to refuse participation or withdraw at any time.

## Results

### Socio-demographic characteristics of participants

The total of participants was 110, (60%) of them were males. Regarding the distribution of participants according to their hospital, 30 (27.3%) from SMC, 23 (20.9%) from NPH, 21 (19%) from NMC, 13 (11.8%) from AH, 14 (12.7%) from EGH and 9 (8.2%) from EH. The distribution of participants according to their occupation, most of them were registered nurses 83 (75.4%), 19 (17.3%) were a practical nurses and 8 (7.3%) work as a supervisor nurse. Classification of them according to the age by years, address, educational qualification, and experience of participants in the NICU as shown in **Table 1**.

### Mean score of nurse's perception about the quality of nursing care

Forty-one items distributed in eight domains to assess the quality of nursing care were answered correctly. Briefly, the total quality of nursing care in NICUs was 75.8%. The average of the domains associated of quality of nursing care in six hospitals were descendingly as following: infection and inflammation (78.6%), respiratory and ventilation (76.8%), safety (76.2%), clinical nursing care practices (76.2%), ethics (75.6%), pain and stress (75%), family-centered care (74%), and professional issues in NICU nursing (73.6%) as shown in **Table 2**.

### The association between the quality of nursing care among nurses and their socio-demographic characteristics

There was statistically significant differences in the mean of pain, stress and family-centered care domains according to nurses address of residences, where the participants who live in North Gaza and Middle zone were lower quality of nursing care than those who live in Khan-Younis and Rafah Governorates P-value (0.003,0.032) as shown in **Table 3**. In the other hand the other domains weren't statistically significant differences according to nurses address of residences because of P-value more than 0.05.

According to educational level, there was significant difference in the average of ethics domain, where the nurses of diploma have lower average in comparison of those with bachelors and master (P: 0.040) as shown in **Table 4**. The quality of the participants have diploma is lower than there have bachelor's and master's degrees, while other variables are not significant with educational level because of P-value more than 0.05.

## Discussion

This study was conducted to assess the quality of nursing services in the NICU at Gaza Strip. The study discovered that the nurses mean quality of nursing services given in NICU was 3.8 in 5-Likert scale, which is equivalent to 75.8%. This result is consistent with

**Table 1** Sample distribution according to socio-demographic data.

Variables	Frequency	Percent
<b>Sex</b>		
Male	66	60.0
Female	44	40.0
<b>Age (years)</b>		
20- 30	60	54.5
31 - 40	40	36.4
More than 40	10	9.1
<b>Address</b>		
North	27	24.5
Gaza	8	7.3
Middle zone	34	30.9
Khan-Younis	23	20.9
Rafah	18	16.4
<b>Occupation</b>		
Practical nurse	19	17.3
Registration nurse	83	75.4
Supervisor nurse	8	7.3
<b>The hospital</b>		
AlShifa	30	27.3
Alnaser	23	20.9
Naseer	21	19.1
Alaqua	13	11.8
EGH	14	12.7
Emaraty	9	8.2
<b>Experience in NICU (years)</b>		
2-5	49	44.5
6-9	44	40.0
More than 9	17	15.5
<b>Educational level</b>		
Diploma	20	18.1
Bachelors	84	76.4
Master	6	5.5
Total	110	100.0

**Table 2** Distribution of the sample according to nurses perception about quality of nursing care in NICUS in Gaza strip.

Items	Mean	SD	WM
1. Identifying effective interventions to prevent or reduce pain or stress	3.82	0.69	76.40
2. Identifying best practices for pain assess,ment	3.73	0.88	74.60
3. Identifying pain and/or stress guidelines	3.71	0.90	74.20
<b>Pain and stress</b>	<b>3.75</b>	<b>0.58</b>	<b>75.00</b>
4. Identifying strategies to support the needs of parents and family members	3.94	0.82	78.80
5. Identifying and evaluating strategies to support parental attachment	3.88	0.81	77.60
6. Identifying best practices for the implementation of family centred care	3.78	0.86	75.60
7. Evaluating the role and involvement of parents in the care of their infant	3.73	0.90	74.60
8. Evaluating developmental care	3.51	0.86	70.20
9. Evaluating the effect of environmental factors on neonatal development	3.52	0.86	70.40
10. Evaluating individual care aspects (sleep, positioning, body language) of developmental care	3.52	0.90	70.40
<b>Family centered care</b>	<b>3.70</b>	<b>0.42</b>	<b>74.00</b>
11. Improving the care and parental education of chronically ill neonates requiring long term care	3.85	0.78	77.00
12. Nursing management of very low birthweight infants	3.86	0.82	77.20
13. Improving nutrition in preterm and sick term infants	3.90	0.79	78.00
14. Identifying best practice in the management of invasive lines and catheters	3.66	0.80	73.20

Items	Mean	SD	WM
15. Identifying best practices in enteral feeding	3.94	0.83	78.80
16. Identifying best practices breast feeding	3.92	0.74	78.40
17. Identifying and evaluating interventions to improve skin and wound care in neonates	3.85	0.84	77.00
18. Identifying and implementing best practices in discharge planning	3.52	0.96	70.40
19. Identifying the best care practices for infants with neurological problems	3.67	0.96	73.40
20. Improving advanced life support strategies to improve patient outcomes	3.88	0.88	77.60
21. Identifying the best care practices for surgical infants	3.72	0.85	74.40
22. Identifying and implementing strategies to promote kangaroo mother (skin-to-skin) care	3.74	0.80	74.80
23. Evaluating strategies for regulation of neonatal temperature	3.82	0.79	76.40
24. Evaluating routine nursing care procedures	4.02	0.78	80.40
<b>Clinical nursing care practices</b>	<b>3.81</b>	<b>0.22</b>	<b>76.20</b>
25. Identifying and evaluating strategies to reduce medication errors	3.49	0.97	69.80
26. Identifying safe medication administration practices	3.93	0.77	78.60
27. Improving patient safety and patient outcomes	3.96	0.74	79.20
28. Improving healthcare team communication and collaboration	4.02	0.77	80.40
29. Identifying and implementing a safe working environment for staff	3.95	0.79	79.00
<b>Quality and safety</b>	<b>3.81</b>	<b>0.22</b>	<b>76.20</b>
30. Improving end-of-life care for neonates and their families	3.81	1.00	76.20
31. Exploring the role of parents in ethical decision making	3.88	0.89	77.60
32. Developing palliative care pathways for neonates	3.64	0.96	72.80
<b>Ethics</b>	<b>3.78</b>	<b>0.54</b>	<b>75.60</b>
33. Identifying best practices in the care of non-invasive ventilation in infants	3.72	0.79	74.40
34. Identifying best practices in the care of the mechanically ventilated infant	3.95	0.77	79.00
<b>Respiratory and ventilation</b>	<b>3.84</b>	<b>0.60</b>	<b>76.80</b>
35. Evaluating infection prevention strategies	4.02	0.73	80.40
36. Identifying and evaluating interventions to monitor and reduce hospital-associated infections	3.87	0.80	77.40
37. Evaluating sepsis management and care to improve outcomes	3.90	0.74	78.00
<b>Infection and inflammation</b>	<b>3.93</b>	<b>0.45</b>	<b>78.60</b>
38. Identifying interventions to implement evidence into NICU nursing practice	3.86	0.82	77.20
39. Identifying strategies to reduce stress and improve performance in NICU nursing	3.83	0.80	76.60
40. Evaluating nursing education and training strategies	3.21	0.90	64.20
41. Evaluating the impact of the changing NICU workforce on patient outcomes (advanced nurse practice roles, physician assistants, etc)	3.82	0.80	76.40
<b>Professional issues in NICU nursing</b>	<b>3.68</b>	<b>0.42</b>	<b>73.60</b>
<b>All</b>	<b>3.79</b>	<b>0.17</b>	<b>75.80</b>

SD: Standard Deviation; WM: Weighted Mean (%)

**Table 3** Mean difference in the domains related to their address.

Domain	Address	N	Mean	SD	F	P-value
<b>Pain and stress</b>	a. a. North	27	3.57	0.68	4.399	0.003*
	b. b. Gaza	8	3.88	0.53		
	c. c. Middle zone	34	3.55	0.59		
	d. d. Khan-Younis	23	4.03	0.33		
	e. e. Rafah	18	4.00	0.46		
	Total	110	3.75	0.58		
<b>Family centered care</b>	f. a. North	27	3.59	0.52	2.758	0.032*
	g. b. Gaza	8	3.77	0.40		
	h. c. Middle zone	34	3.58	0.44		
	i. d. Khan-Younis	23	3.85	0.25		
	j. e. Rafah	18	3.85	0.27		
	Total	110	3.70	0.42		

P ≤ 0.05: Significant, P &gt; 0.05: Not significant; N: number of the subjects; SD: standard deviation; &amp; F: one-way ANOVA

the study conducted at Debre Berhan Referral Hospital, Ethiopia 77% [15]. This similarity might be due to almost of the nurses

taken educational and training courses that will improve the practice interventions in NICU.



**Table 4** Mean difference in the ethics related to their education level.

Domain	Education level	N	Mean	SD	F	P-value
Ethics	a. Diploma	20	3.65	0.56	3.318	0.040*
	b. Bachelors	84	3.77	0.53		
	c. Master	6	4.28	0.39		
	Total	110	3.78	0.54		

P ≤ 0.05: Significant, P > 0.05: Not significant; N: number of the subjects; SD: standard deviation; & F: one-way ANOVA.

Adherence of infection prevention and control protocol is one of the main issues that reduce of complications and neonatal mortality. The study showed that the mean of infection and inflammation domain was 78.6%. The result is consistent with another study conducted by Eljedi and Dalo that explained 79% [16]. The similarity between those studies is result all the nursing team have good knowledge and practice of hand washing and applying the main infection prevention guideline.

The study discovered that the mean of safety application was 76.2%, this result is inconsistent with another study showed 68% of health care professionals reported that they recapped, broke or bent used needles before disposal [17]. In this study hospitals' sharps containers were available, so there was not need to recap needles.

Regarding to family centered care, the hospitalization of neonates for a long period made parents and the family feel anxious and stressed [18]. The quality of nursing care according to family-centered care was 74%. This finding is inconsistent with another study showed that most nurses apply family centered care principles (93%) [19]. This clear difference between the two studies is due to work pressure and a shortage of nurses in Gaza hospitals corresponding to the standard number of patients in NICUs. This shortage of nurses number pushed them to focus on the children's health status and neglected family centered care. The international ratio in the NICU was 1:1 but this ratio wasn't achieved in governmental hospitals in Gaza, where the ratio is 1:4.

Regarding to pain and stress, the neonates often require repeated invasive needle-related procedures throughout their hospitalization. Reducing neonates' pain during medical and nursing procedures is important. High-quality synthesized evidence demonstrates analgesic effects of three pain management strategies: breastfeeding; skin-to-skin care, also referred to as kangaroo care; and small amounts of sweet solutions [20]. In this study the quality of nursing service of pain and stress was 75%. This finding is inconsistent with another study conducted by Willeia et al. showed that nurses acknowledged of pain neonates' and the importance of pain control to minimize children's development risks, the pain was primarily evaluated by behavioral indicators, such as weeping, facial mimics, and motor activity [21]. This statistically significant difference is due to the irregularity in applying the neonatal protocol in NICUs of Gaza hospitals, which focuses on administering sedative drugs before any painful medical procedure, and also as a result of work pressure.

## Conclusion

There wasn't significant differences between the quality of nursing services average according to socio-demographic variables such as: gender, age, experience in NICU and occupation. But there was statistically significant difference in family-centered care average according to nurses address of residence, where the participants in North Gaza and Middle zone have less quality of nursing care than those in Khan-Younis and Rafah Governorates. This result could be attributed to that the nurses who live in Northern Gaza and Middle zone are working in hospitals of high work pressure and full of patients "SMC and NPH", while those who live in Khan-Younis and Rafah Governorates are working in hospitals of less work pressure and few of patients "EGH and NMC". The working in hospitals of less work pressure and fewer patients give more chance and time for nurses to provide the best services and good quality regarding the family centered care.

## Limitations of the Study

This study had several limitations; first: many independent factors that may affect the quality of nursing care weren't study. Hereafter, further studies are recommended to exclude potential confounding factors. Secondly, we did not have all the NICUs nurse's team in governmental hospitals. To better understand such effects, taking all the nursing teams with a large sample size is recommended. Thirdly, the nature of cross-sectional design which limits the causal effect relationship.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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