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Facilitators and Barriers for Delivery of Palliative Care Practices among Nurses in Neonatal Intensive Care Unit

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Abstract:

A. Background*: Neonatology has made significant advances in the last 30 years. Despite the advances in treatment, not all neonates survive, and a palliative care model is required within the neonatal context. Palliative care is an approach by which healthcare providers support both dying neonates and their families to improve their quality of life.*

B. Aim: *This study aimed to identify the facilitators and barriers to delivering palliative care practices among nurses in the neonatal intensive care unit.*

C. Design: *A descriptive correlational study design was adopted to carry out this study.* ***Setting:*** *the study was conducted at the Neonatal Intensive Care Unit (NICU) at Alexandria University Children's Hospital (AUCH) in El Shatby.*

D. Subjects: *The total number of the purposively selected nurses was 130 worked at neonatal intensive care unit* ***Tools****: data were collected using two tools;* ***tool (I)*** *entitled Nurses' Knowledge Structured Questionnaire about Palliative care:* ***tool (II)*** *Neonatal Palliative Care Attitude Scale (NIPCAS).*

E. Results: *Detected that 62% of the studied nurses had a moderate level of barriers to palliative care, and 22% of them had a high level, while 16% of them had a low level. In addition to this, it was observed that there was a highly positive correlation between insufficient resources and technology, personal & social attitude, and organizational culture. According to the linear regression model, it was observed that there was a significantly higher frequencies effect of gender and professional degree as predictors on palliative care (p = <0.01). At the same time, religion was not predicted by relation to palliative care (p = 0.065).*

F. Recommendations: *Neonatal nurses should have adequate training regarding the delivery of palliative care. In addition, standard palliative care guidelines should be available at the NICU to assist in delivering such care.*

Keywords: *Neonatal, Palliative care, Nurses, Intensive care unit, Barriers, facilitators.*

I. INTRODUCTION

A neonate's death in the neonatal intensive care unit (NICU) environment is a difficult time for families, medical, nursing, and allied health staff. Despite technological advances in neonatal care and the increases in the margins of viability and skilled health care delivery, a significant number of neonates are affected by life-threatening conditions. Nonetheless, the death of a baby in this highly curative environment may be viewed as a medical science failure. While this highly technical environment saves neonates' lives, healthcare also needs to provide the needs of neonates who will die before they leave the hospital environment. (1,2)

Globally, the World Health Organization (WHO) estimated that 1.2 million infants and children worldwide need palliative care at the end of life. In Egypt, the infant mortality rate was 25 deaths per 1000 births, and the neonatal mortality rate was 16 deaths per 1000 births. This indicates that about 87% of early childhood deaths in Egypt are taking place before the child's first birthday, with more than half (58%) occurring during the neonatal period (neonates whose ages are less than 28 days); deaths in this period make up 11 per one thousand live births in Egypt most of which are attributable to prematurity and low birth weight or congenital anomalies. The majority of these deaths occur in intensive care settings. (3)

Palliative care is an approach that emphasizes providing comprehensive care to infants and children with life-threatening conditions and their families, strives to enhance the quality of life in the face of a life-threatening illness without hastening or postponing death, and helps the individual to live as long and normally as possible. (4, 5)This includes both compassionate care for the living neonate and bereavement support for the family. (6) The implementation of neonatal palliative nursing care is stressful but rewarding and requires coping skills and confidence in patient care and the care of bereaved families. When the decision has been made to forego high-tech life-sustaining treatment in exchange for a neonate's peaceful death, palliative care should be provided. (7, 8)

The International Council of Nurses (9) views the nurse's role as fundamental to the palliative approach that aims to reduce suffering and improve the quality of life for dying neonates and their families through early assessment, identification, and management of physical, social, psychological, spiritual, and cultural needs.

Educating nurses about communicating palliative needs to families is an important step in establishing achievable goals of care. (10)

Nurses often are the ones who know where the palliative care plan is housed and can make sure the team knows how to find the plan to ensure care coordination. Nurses are the Health Care Professionals (HCPs) that link families to community resources and ensure that follow-up with the family occurs. Many institutions hold annual memorial services to honor the memories of children who have died. These services are a time when nurses and families can reunite. Not all families or health professionals will want to participate. Cultural values and beliefs will influence how families view these services, but they need to know that they care for them do not end with their child's death. (11)

However, neonatal palliative care is a context of nursing practice about which little is known. Empirical research in palliative care practice in neonatal nursing is scant and largely polemic. The available literature suggests that palliative care is not embraced in neonatal nursing with the same enthusiasm as curative care models, and barriers to a palliative care model in neonatal nursing may exist but are unexplored. (12)

A. Aim of the study:

This study aimed to identify the facilitators and barriers to delivering palliative care practices among nurses in the neonatal intensive care unit.

B. Research question:

What are the facilitators and barriers to delivering palliative care practices among nurses in the neonatal intensive care unit?

II. MATERIAL AND METHODS

A. Material

a) Study design:

Descriptive correlational study design was used to accomplish this study.

b) Study setting:

The study was conducted at the Neonatal Intensive Care Unit (NICU) at Alexandria University Children's Hospital (AUCH) in El Shatby.

c) Study subjects:

Nurses working with neonates attending the setting mentioned above were considered eligible for the study.

d) Study sample:

A purposive sample of 130 nurses available at the time of data collection participated in the study after fulfilling the following inclusion criteria:

- Working as full-time neonatal nurses.
- I had experience working in NICU for more than 6 months.

e) Study tools:

The tool I: Nurses' Knowledge Structured Questionnaire about Palliative care:

This questionnaire was developed and designed by the researchers to obtain nurses' background knowledge assumed to influence their attitudes toward facilitators and neonatal palliative care barriers. It includes personal characteristics (age, gender, marital status, and residence), professional characteristics (educational level, years of experience), and previous personal experiences related to neonatal death and religious effect.

Tool II: Neonatal Palliative Care Attitude Scale (NIPCAS)

This scale was used to examine participants' attitudes toward facilitators and barriers of palliative care in the NICU. This instrument was developed by Kain et al., 2009. [13] It is consisted of 25 items. The items are scored from 1 to 5 (1= strongly disagree, 2= somewhat disagree, 3= unsure (neutral), 4= somewhat agree, and 5= strongly agree). The items were classified into five categories which are: (1) resources (5 items), (2) use of technology (2 items), (3) personal and social attitudes (6 items), (4) organizational culture (5 items), and (5) nursing proficiency (7 items). Scoring system for assessing the nurses' attitude towards palliative care practice in the neonatal care unit was performed as follows: High barriers <50% of the total score, moderate barriers 50%-70% of the total score, and low barriers than 70% of the total score.

B. Methods

a) Administrative process

- An official letter from the Faculty of Nursing, Damanhour University, was obtained and forwarded to the (AUCH) director to obtain permission to conduct the study.
- A meeting was held with the NICU director to clarify the study's purpose, set the time for beginning the study, explain the process of the study, and gain their cooperation and support during data collection.

b) Development of the study tools

After reviewing recent literature, the researchers developed a tool (I) to collect the studied nurses' required data. The validity and reliability of the NIPCAS have been checked and confirmed in previous research. [13-15] In Egypt's context, no studies were found that assessed the reliability and validity of this scale; therefore, they were rechecked. 5 members evaluated the content validity of NIPCAS in the Faculty of Nursing in Alexandria and Damanhour Universities. According to experts' comments, the items were classified into 5 categories, including (1) resources (5 items), (2) use of technology (2 items), (3) personal and social attitudes (6 items), (4) organizational culture (5 items), and (5) nursing proficiency (7 items). To assess the translated scale's reliability, the α coefficient of internal consistency (n = 13) was computed. α-Coefficient for this

scale was 0.801. Therefore, the translated scale presented acceptable reliability.

c) Pilot study

- The researchers carried out a pilot study on (13) nurses from another setting but working under the same circumstances and fulfilling the same inclusion criteria to test the clarity and feasibility of both tools (I and II); consequently, necessary modifications were done. Those nurses were excluded from the study.

d) Data collection

- All nurses had been fully informed about the research, and the purpose of the study was to explain to gain their cooperation for participation in the research. A good relationship was established with them.
- A total of 130 copies of questionnaires, together with a pen, were hand-delivered directly to the participants. Every nurse was asked to fill in the questionnaire during their breaks and submit it to the researchers. The nurses completed it on the spot and hands it back. The questionnaire was attached with a cover letter describing the goals of the study. The researchers also provided some oral information about the study.
- The study was conducted in the period from August to November 2019.

e) Statistical analysis:

- After data collection, the collected data were coded and transferred into a specially designed format suitable for computer feeding.
- Data were entered into the computer and analyzed using the statistical package of social science (**SPSS**) version 20.
- Data entry data were checked and revised through frequency analysis, cross-tabulation, and manual revision to discover any errors during data entry.
- Variables were analyzed using descriptive statistics, which included: percentages, frequencies, range (minimum and maximum), arithmetic mean, and standard deviation (**SD**).
- The level of significance selected for this study was **$p \leq 0.05$**.
- The Chi-square test (X^2) was used for testing the relationship between categorical variables.
- Spearman's Pearson correlation was used to test the correlation between two quantitative variables not normally distributed or dichotomous qualitative variables.
- Linear Regression Model was used to indicate the predictors among nurses. The model was statistically significant ($p \leq 0.05$)
- Graphs were done for data visualization by using the Microsoft Excel program.

f) Ethical considerations:

- Permission was obtained to collect the data from the previous setting.
- Written informed consent was obtained from the nurses after explaining the study's aim and assuring them that collected data will be used only for the study purpose.
- The Director of the selected setting was informed about the date and the time of data collection.
- Confidentiality and anonymity of individuals' responses were guaranteed by using a code number instead of names.

III. RESULTS

Table (1): Distribution of the neonatal nurses according to their characteristics (n=130).

Characteristics	No	%
Age		
19- < 29	95	73.1
29- < 39	23	17.7
39 – 49	12	9.2
$\bar{x}$ & S.D **26.75± 4.05**		
Gender		
Male	30	23.1
Female	100	76.9
Marital Status		
Single	39	30
Married	85	65.4
Divorced	2	1.5
Widow	4	3.1
Residence		
Rural	61	46.9
Urban	69	53.1
Religion		
Muslim	120	92.3
Christian	10	7.7
Years of Experience		
1- <5 years	84	64.6
5- <10 years	36	27.7
≥ 10 years	10	7.7
$\bar{x}$ **SD 4.23± 3.61**		
Professional degree		
Diploma	10	7.7
Clinical institute	41	31.5
Bachelor's degree	74	56.9
Master's	5	3.9
Formal neonatal palliative care education		
Yes	25	19.2
No	105	80.8

Table (1): Reveals that the mean age and years of experience of studied nurses were 26.75± 4.05 and 4.23± 3.61, respectively. This table also shows that about three-quarters of them (76.9%) were females, and (65.4%) were married. Regarding the professional degree of nurses, more than half of them (56.9%) had a bachelor's degree. At the same time, only (19.2%) of them had formal neonatal palliative care education.

Figure (1): Percentage distribution of the studied nurse regarding the previous self-education about neonatal palliative care

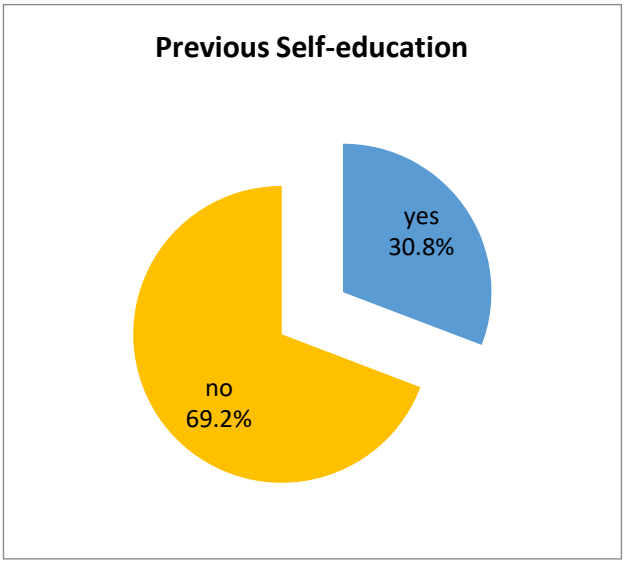

Figure (1): detects that only less than one-third of the studied nurses (30.8%) had previous self-education about neonatal palliative care.

Figure (2): Percentage Distribution of studied nurses regarding personal religious beliefs on the perception of neonatal palliative care

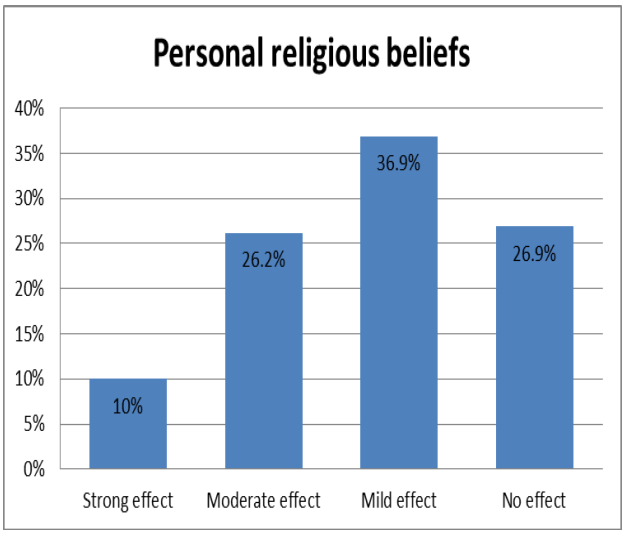

Figure (2): Regarding the effect of personal religious beliefs on the perception of neonatal palliative care, this figure shows that 36.9% and 26.9% had a mild effect and no effect, respectively.

Table (2): Mean scores distribution of the studied nurses according to resources (n=130).

Items	Agree	Unsure	Disagree	Mean S. D
	N (%)	N (%)	N (%)	
The physical environment of my unit is ideal for providing palliative care to dying neonates.	39(30)	61(46.9)	30(23.1)	2.06±0.87
My unit is adequately staffed for providing the needs of dying neonates requiring palliative care and their families.	35(26.9)	59(45.4)	36 (27.7)	1.99±1.01
When a neonate dies in my unit, I have sufficient time to spend with the family.	40 (30.8)	46 (35.4)	44 (33.8)	1.96±0.45
There are policies/guidelines to assist in the delivery of palliative care in my unit.	30 (23.1)	58 (44.6)	42(32.3)	1.91±0.61
When a neonate dies in my unit, counseling is available if I need it.	42 (32.3)	50 (38.5)	38 (29.2)	2.03±0.64
Total	9.95±3.58			

Table (2): Indicates that regarding resources, about one-third of the studied nurses (33.8%) claimed that they don't have sufficient time to spend with the family when a neonate dies. While (32.3%) stated that counseling is available if they need it when a neonate dies. Finally, the total mean score regarding the domain of the resource was 9.95±3.58.

Table (3): Mean scores distribution of the studied nurses according to technology (n=130).

Items	Agree	Unsure	Disagree	Mean S. D
	N (%	N (%)	N (%)	
In my unit, the staff go beyond what they feel comfortable within using technological life support	35 (26.9)	55 (42.3)	40 (30.8)	1.80±0.48
In my unit, the staff is asked by parents to continue life-extending care beyond what they feel is right.	49 (37.7)	50 (38.5)	31(23.8)	2.13±0.52
Total	3.93±1			

Table (3): According to technology, more than one-quarter of the studied nurses (30.8%) disagreed that the staff goes beyond what they feel comfortable using technological life support. While (37.7%) agreed that staff is asked by parents to continue life-extending care beyond what they feel is right. Finally, the mean scores regarding the use of the technology domain were 3.93±1.

Table (4): Mean scores distribution of the studied nurses according to personal and social attitudes (n=130).

Items	Agree		Unsure		Disagree		Mean S. D
	N	%	N	%	N	%	
Palliative care is as important as curative care in the neonatal environment.	30	23.1	70	53.8	30	23.1	2.0±0.55
When neonates are dying in my unit, providing pain relief is a priority for me.	29	22.3	68	52.3	33	25.4	1.96±0.62
Palliative care is necessary for neonatal nursing education.	34	26.2	80	61.5	16	12.3	2.14±0.34
Palliative care is against the values of neonatal nursing.	24	18.5	64	49.2	42	32.3	1.86±0.59
There is support for neonatal palliative care in society.	22	16.9	74	56.9	34	26.2	1.91±0.88
There is a belief in society that neonates should not die under any circumstances.	19	14.6	82	63.1	29	22.3	1.93±0.74
Total	11.8±3.72						

Table (4): Illustrates that relating to personal and social attitudes, nearly one-third of the studied nurses (32.3%) disagreed that palliative care is against the values of neonatal nursing. At the same time, almost one-quarter of them (26.2%) stated that palliative care is necessary for neonatal nursing education. Finally, mean scores regarding the personal and social attitudes domain were 11.8±3.72.

Table (5): Mean scores distribution of the studied nurses according to organizational culture (n=130).

Items	Agree		Unsure		Disagree		Mean S. D
	N	%	N	%	N	%	
The medical staffs support palliative care for dying neonates in my unit.	29	22.3	61	46.9	40	30.8	1.91±0.60
In my unit, parents are involved in decisions about their dying neonates.	36	27.7	64	49.2	30	23.1	2.04±0.76
When a diagnosis with a likely poor outcome is made in my unit, parents are informed of palliative care options.	42	32.3	50	38.5	38	29.2	2.03±0.68
The team expresses its opinions, values, and beliefs	31	23.8	57	43.9	42	32.3	1.91±0.59

about providing care to dying neonates in my unit.							
All health care team members in my unit agree with and support palliative care when implemented for a dying neonate.	34	26.1	66	50.8	30	23.1	2.05±1.01
Total	9.94±3.64						

Table (5): Concerning the organizational culture, the same percentage of nurses (32.3%) disagreed that the health team expresses its opinions, values, and beliefs about providing care to dying neonates, but agreed that parents are informed of palliative care options when a diagnosis with a likely poor outcome is made. Finally, the mean scores regarding the organizational culture domain were 9.94±3.64.

Table (6): Mean scores distribution of the studied nurses according to the nursing proficiency domain (n=130).

Items	Agree		Unsure		Disagree		Mean S. D
	N	%	N	%	N	%	
I have had the experience of providing palliative care to dying neonates and their families.	60	46.2	45	34.6	25	19.2	2.26±1.02
My previous experiences of providing palliative care to dying neonates have been rewarding.	39	30	58	44.6	33	25.4	2.04±0.63
I have received in-service education that assists me in supporting and communicating with parents of dying neonates.	45	34.6	55	42.3	30	23.1	2.11±0.49
I am often exposed to death in the neonatal environment	65	50	30	23.1	35	26.9	2.23±0.71
Caring for dying neonates is traumatic for me.	40	30.8	59	45.4	31	23.8	2.06±0.87
I feel a sense of personal failure when a neonate dies.	55	42.3	35	26.9	40	30.8	2.11±0.83
My attitudes about death affect my willingness to deliver palliative care.	39	30	41	31.5	50	38.5	1.91±0.77
Total	14.72±5.32						

Table (6): Regarding nursing proficiency, more than one-third of the studied nurses (38.5%) disagreed that their attitudes about death affect their willingness to deliver palliative care. Half of them (50%) stated that they are often exposed to death in the neonatal environment. Finally, the mean scores regarding the nursing proficiency domain were 14.72±5.32.

Figure (3): Percentage distribution of the studied nurses regarding their total barriers of palliative care

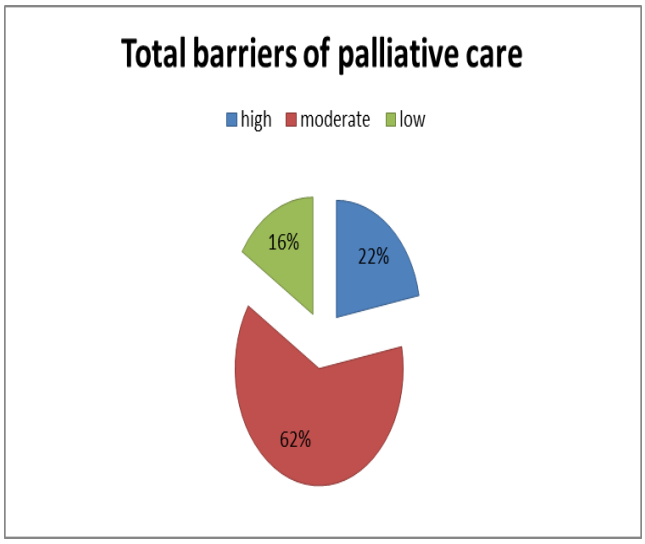

Figure (3): detects that more than half of the studied nurses (62%) had a moderate level of barriers to palliative care, while (22%) of them had a high level, and (16%) them had a low level.

Figure (4): Mean scores distribution of the studied nurses regarding their total scores of domains (n= 130).

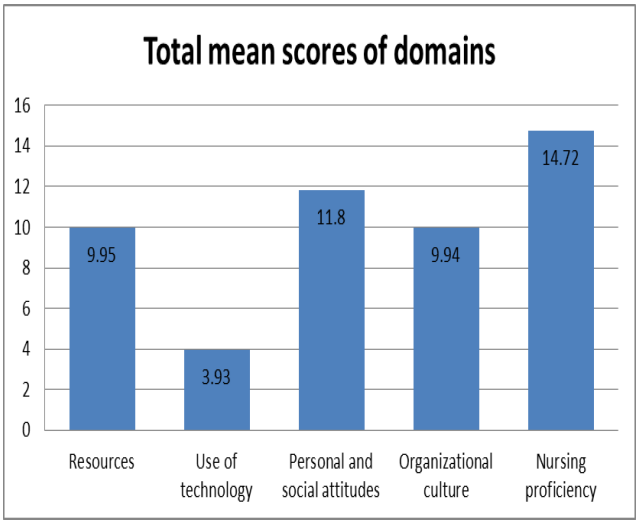

Figure (4): indicates that a high mean score was related to nursing proficiency followed by personal and social attitudes.

Table (7): Correlation between characteristics of the neonatal nurses and their total barriers of palliative care (N=130)

Items		Barriers to Palliative care						X^2	p-Value
		High 28		Moderate 81		Low 21			
		N	%	N	%	N	%		
Age	19- < 29	23	82.1	67	82.7	5	23.8	6.550	.043*
	29- < 39	5	17.9	11	13.6	7	33.3		
	39 - 49	0	0	3	3.7	9	42.9		
Gender	Male	0	0	23	28.4	7	33.3	10.935	.004**
	Female	28	100	58	71.6	14	66.7		
Marital status	Single	6	21.4	31	38.3	2	9.5	9.114	.024*
	Married	20	71.4	48	59.3	17	81		
	Divorced	0	0	2	2.4	0	0		
	widow	2	7.2	0	0	2	9.5		
Residence	Rural	18	64.3	39	48.1	4	19	10.641	.031*
	Urban	10	35.7	42	51.9	17	81		
Religion	Muslim	28	100	72	88.9	20	95.2	1.196	.550
	Christian	0	0	9	11.1	1	4.8		
Years of Experience	<5 years	18	64.3	63	77.8	3	14.3	7.951	.027*
	5-<10 years	9	32.1	17	21	10	47.6		
	≥ 10 years	1	3.6	1	1.2	8	38.1		
Professional degree	Diploma	1	3.6	8	9.9	1	4.8	12.739	.002**
	Clinical institute	9	32.1	24	29.6	8	38.1		
	Bachelor's	18	64.3	46	56.8	10	47.6		
	Master's	0	0	3	3.7	2	9.5		
Formal education	Yes	2	7.1	21	25.9	2	9.5	6.246	.044*
	No	26	92.9	60	74.1	19	90.5		

***significant at p ‹ 0.05 **highly significant at p ‹ 0.01.**

Table (7) reveals a highly significant relationship between gender, professional degree, and palliative care barriers at a p-value <0.01. At the same time, there was no relation between religion and barriers of palliative care at p-value >0.05.

Table (8): Correlation Matrix between studied domains

Items	1	2	3	4
1- Resources		r 0.385 p.000**	r 0.508 p.000**	r 0.644 p.000**
2-Use of technology	r 0.385 p.000**		r 0.101 p.254	r 0.239 p.006**
3-Personal and social attitudes	r 0.508 p.000**	r 0.101 p.254		r 0.693 p.000**
4-Organizational culture	r 0.644 p.000**	r 0.239 p.006**	r 0.693 p.000**	
5-Nursing proficiency	r 0.103 p.240	r 0.115 p.161	r 0.165 p.061	r 0.074 p.411

****highly significant at p ‹ 0.01.**

Table (8): Shows a highly positive correlation between resources and use of technology, personal & social attitude, and organizational culture at p. value <0.01. On the other hand, there was no correlation between nursing proficiency and other domains at p.value >0.05

Table (9): Multiple Linear regression model

	Unstandardized Coefficients	standardized Coefficients		
	B	β	**T**	**P. value**
Age	.461	.454	7.482	.014*
Gender	.708	.154	12.825	.005**
Marital status	.466	.510	5.164	.011*
Residence	.654	.656	6.351	.012*
Religion	.215	.368	1.300	.065
Years of Experience	.689	.417	8.001	.013*
Professional degree	.935	.717	16.407	.000**
Formal neonatal palliative care education	.746	.511	7.251	.010*

Model summary				
Model	R	R square	Adjusted R square	Std. error of estimate
Regression	.954	.912	.864	.524

***significant at p ‹ 0.05 **highly significant at p ‹ 0.01.**

a. Dependent Variable: palliative care

b. Predictors: (constant) Age, Gender, Marital status, Residence, Religious, Years of Experience, Professional degree, Formal neonatal palliative care education

This table (9) reveals that there were significantly higher frequencies effect of gender and professional degree as predictors of palliative care (p<0.01). In contrast, religion was not predicted in relation to palliative care (p = 0.065).

IV. DISCUSSION

Significant advances in neonatology have been performed in the last 30 years. Surfactant therapy, improved ventilators, ventilation strategies, improved surgical techniques, and parenteral feeding have enabled vulnerable neonates' survival. Despite the advances in treatment, not all neonates survive, and a palliative care model is required within the neonatal context [16].

According to the characteristics of the studied neonatal nurses, the current study revealed that nurses' mean age was 26.75± 4.05 years. The majority of them were females, and slightly more than half of the nurses had bachelor's nursing degrees. Their mean years of experience were 4.23± 3.61years. These results are congruent with the study conducted by Zaki et al., 2018[17]about nurses' performance regarding care for neonates with necrotizing enterocolitis, who detected that nurses' mean age was 25.93±4.36 and less than half of them had a diploma and technical institute. While these current results are inconsistent with the study performed by Ali et al., 2019[18]in Jordan about nursing knowledge and care for neonates with respiratory distress, who reported that the mean age of neonatal nurses was 32.23 ± 5.01 years, most of them had Bachelor degree and their mean years of experience was 6.5 ± 4.4 years.

Regarding the previous self-education about neonatal palliative care, the current study revealed that only less than one-third of them had the previous self-education, and less than one-fifth of them had formal neonatal palliative care education. This may be because palliative care in Egypt is in an early stage of development, and it does not receive the required attention to informal teaching. These results are supported by the study performed by Peng et al., 2018[19] titled "Evaluation of Comfort and Confidence of Neonatal Clinicians in Providing Palliative Care," which revealed that there was no educational training for nurses about palliative care. On the other hand, these results are inconsistent with the study conducted by AbdelRazeq, 2019[20]in Jordan about end-of-life decisions at neonatal intensive care units, who found that more than two-thirds of the studied neonatal nurses had awareness workshops about palliative care.

According to the effect of the studied neonatal nurses' religious beliefs on the perception of neonatal palliative care, the current study revealed that more than half of them were between mild effect to no effect. This may be due to that nurses don't want to impose their religious beliefs on their profession. This result is consistent with the results of the study performed by Kilcullen& Ireland, 2017[21]in Australia to assess neonatal nursing staff perceptions of facilitators and barriers regarding palliative care, who stated that religious beliefs of the nurses had a slight effect on the perception toward palliative care. On the contrary, this result is not in harmony with the results of the study conducted by Forouzi et al., 2017[22]in Iran about barriers of palliative care in neonatal intensive care units, who declared that two-thirds of the participants reported that religious beliefs had a high effect on palliative care perception.

Regarding palliative care barriers, according to insufficient resources, the current study showed that total mean scores were 9.95±3.58 and meant scores related to the physical environment as a barrier was 2.06±0.87. These findings may be attributed to the fact that busy, open, and non-private NICU may not be the proper place for palliative care to take place. KYC et al. support this result., 2019[23]in the United States, who investigated the similarities and differences between medical and nursing perceptions of neonatal palliative care and found that a physical environment not conducive to providing palliative care highlighted. Additionally, the mean score related to the insufficiency of time was1.96±0.45. This may be due to the fact that nurses are often assigned to take care of more than 3 neonates during each shift. So they are overwhelmed and can't decide whether to spend time with a dying neonate and the family or to devote this time for other neonates to maintain their life. Davies et al. support this finding., 2008[24] reported that lack of time is the most frequent barrier in providing palliative care.

Concerning palliative care barriers according to the inappropriate use of technology, the current study showed that the total mean score was 3.93±1. This result is not in accordance with the survey conducted by Dombrecht et al., 2019[25] about barriers to and facilitators of end-of-life decision making by neonatologists and neonatal nurses in neonates, as it considered the use of technology as a facilitator to palliative care.

The current study revealed that personal and social attitude was considered a barrier to performing palliative care at neonatal care, that the total mean score was 11.8±3.72. This finding might be due to nurses' insufficient knowledge and low level of awareness about palliative care. This result is incompatible with the study conducted by Kim et al., 2019[26] about nurses' roles and challenges in providing end-of-life care in neonatal intensive care units in South Korea, and the study performed by Dombrecht et al., 2019[27]titled "Psychological support in end-of-life decision-making in neonatal intensive care units," who detected organizational and social support toward palliative care.

The present study reported that organizational culture was a barrier to palliative care, as evidenced by a total mean score of 9.94±3.64. This result is concurrent with the study performed by Cortegiani et al., 2018[28]in Italy about attitudes towards end-of-life issues in the intensive care unit, who reported that most health caregivers stated that organizational culture was a high barrier.

The nursing proficiency domain was considered a moderate barrier to palliative care, as evidenced by a total mean score of 14.72±5.32 and mean years of experience working at NICU was 4.23±3.61. This result may be attributed to the fact that nurses didn't receive adequate education and training regarding palliative care provision. This finding is inconsistent with the study performed by Ke et al., 2019[29] about the perceived quality of palliative care in intensive care units among doctors and nurses in

Taiwan, and the study performed by Park & Oh, 2019[30]titled "Influence of perceptions of death, end-of-life care stress, and emotional intelligence on attitudes towards end-of-life care among nurses in the neonatal intensive care unit," who detected that more than three-quarters of nurses showed that nursing competency was a facilitator to palliative care.

According to total palliative care barriers, the current results detected that less than two-thirds of studied nurses had a moderate palliative care barrier level. In contrast, less than one-quarter of them had a high level. These results agree with the study conducted by Al-Hajery et al., 2018[31], titled "Perception, knowledge, and barriers to end of life palliative care among neonatal and pediatric intensive care physicians," who mentioned that the majority of the participants had barriers to palliative care. On the other hand, the current results are not supported by the study conducted by Ganz& Sapir, 2019[32] titled "Nurses' perceptions of intensive care unit palliative care at the end of life," who reported that only less than one-third of the nurses had barriers during performing palliative care.

Regarding the relation between the neonatal nurses' characteristics and their total palliative care barriers, the current study determined a highly significant relationship between gender, professional degree, and barriers of palliative care at a p-value <0.01. At the same time, there was no relation between religion and barriers to palliative care at p-value >0.05. These results are congruent with the study conducted by Quinn &Gephart, 2016[33] titled "Evidence for implementation strategies to provide palliative care in the neonatal intensive care unit," who reported a highly significant relation between age & educational level and barriers of palliative care. But, incongruent with the study performed by Keslant et al., 2019[34] about a unique model for palliative care in the Neonatal Intensive Care Unit, who reported that religion has a high impact on palliative care.

According to the linear regression, the current results revealed a significantly higher frequencies effect of gender and professional degree as predictors of palliative care (p = <0.01). While, no religious relation predicted to palliative care (p = 0.065). These results are consistent with the study conducted by Marc-Aurele et al., 2017[35] about primary palliative care in neonatal intensive care, who found that educational level had a high impact on effective palliative care. On the other hand, the current results are not compatible with the study performed by AbdelRazeq, 2019[20]in Jordan about end-of-life decisions at NICU, who reported that religion positively affected palliative care.

V. CONCLUSION

This study identified facilitators and barriers in the delivery of quality palliative care for neonates. The study concluded that 62% of studied nurses had a moderate level of palliative care barriers, while 22% had a high level, and 16% had a low level. There was a highly positive correlation between insufficient resources and technology, personal & social attitude, and organizational culture. Also, there were significantly higher frequencies of gender and professional degrees as predictors of palliative care (p <0.01). At the same time, religion was not predicted by relation to palliative care (p = 0.065).

VI. RECOMMENDATIONS

Based on the current study results, it is recommended that neonatal palliative care be improved by establishing standard palliative care guidelines that provide a framework for neonates' care for neonates with serious and life-threatening conditions. Furthermore, neonatal nurses should have adequate training regarding the provision of palliative care to neonates. In this regard, neonatal palliative care should be incorporated into nursing curricula. Moreover, in-service education and training programs should be provided to all healthcare members working at NICUs. This can be implemented through workshops, seminars, and clinical case reviews on neonatal loss and bereavement care.

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