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Physicians' and nurses' decision making to encounter neonates with poor prognosis in the neonatal intensive care unit

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Abstract

Background: Decision making regarding the treatment of neonates with poor prognoses is difficult for healthcare staff working in the neonatal intensive care unit (NICU). This study aimed to investigate the attitudes of physicians and nurses about the value of life and ethical decision making when encountering neonates with poor prognosis in the NICU.

Methods: This cross-sectional study was conducted in five NICUs of five hospitals in Tehran city, Iran. The attitudes of 144 pediatricians, gynecologists and nurses were assessed using the questionnaire of attitude toward the value of life and agreement on intensive care management based on three hypothetical case scenarios of neonates with poor prognosis. Data were analyzed using descriptive and inferential statistics via the SPSS software.

Results: The negative agreement on the no initiation of intensive care measures and the discontinuation of resuscitation in neonates with poor prognosis was more than the positive agreement. Also, various factors influenced the participants' decision making for the provision of care to neonates. Regarding the case scenarios, the participants agreed on the provision of aggressive, conservative, and palliative care with various frequencies. This study confirms the importance of healthcare providers' perspectives and their impacts on ethical decision making. The participants favored the value or sacredness of life and agreed on the use of all therapeutic measures for saving the lives of neonates with poor prognosis.

Conclusion: More studies are required to improve our understandings of factors influencing ethical decision making by healthcare providers when encountering neonates with poor prognosis in NICUs.

Keywords

Attitude, decision making, ethics, neonatal intensive care unit, poor prognosis

Introduction

Given the development of the neonatal intensive care unit (NICU) and advances in treatment modalities, the number of neonates who are at the end stage of chronic diseases has increased. Provision of intensive care to neonates is intertwined with ethical conflicts. For instance, healthcare professionals working in the NICU face difficult situations in patient care and should make decisions on the start and stop of treatment for neonates with a low survival chance. It can create many scientific, ethical, religious, and legal challenges for making an appropriate decision on the provision care,[1–5] especially for neonates suffering from prematurity, asphyxia, and congenital malformations.[6] Above all, there is no consensus on criteria by which neonates could be candidates for palliative care rather than intensive care.

Any form of euthanasia is forbidden in many cultures based on the perspective of the sacredness of life. However, it is believed that the value of life is

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associated with the present or future capacity, which defines quality of life. A number of intermediate positions that identifies between these two extremes have been the source of ongoing discussions by ethicists, legal experts, and policymakers.[7–9] Therefore, through accepting the sacredness of life, starting and continuing intensive interventions to preserve the neonate's life is required. Continuing tough measures for neonates with a low life expectancy or low quality of life in developing countries has limited the number of beds to provide care to neonates with a better health condition.[10]

In the Islamic perspective, the human life is valuable and saving one life is considered equal to saving the life of all mankind. Also, healthcare professionals are responsible to do everything possible to preserve the patient's life and improve his/her well-being. However, there are limitations in equipment and facilities to provide appropriate care to all patients. Given the sacredness of the human life and the value of human's existence, therapeutic measures that bring about severe consequences and violate human dignity should be discontinued. Patients with end stage diseases or multiple organ failures are not subjected to futile and invasive procedures such as cardiopulmonary resuscitation or surgeries.[11,12] Medical futility is an extremely complex, ambiguous, situation-specific, and goal-dependent concept, which is almost surrounded by some degrees of uncertainty. There is no objective and valid criteria for determining medical futility.[13] Nurses working in the neonatal care units report a great deal of ethical challenges in their practice, because of their constant contact with patients and their family members.[14–16] The functions and perspectives of healthcare providers are different with regard to the provision of care to neonates at the end stage of life in various contexts and cultures.[17,18] Therefore, the aim of this study was to investigate the attitudes of physicians and nurses about the value of life and ethical decision making when encountering neonates with poor prognosis in the NICU.

Methods

Design and sample

A cross-sectional study was conducted over a period of three months in five NICUs of five hospitals in Tehran city, Iran from October 2016 to January 2017. The NICUs were selected using convenience sampling via census from three teaching and two non-teaching hospitals with 5–30 active beds. In the NICUs, care was provided to neonates with various diseases around the clock and 24 hours a day. All healthcare staff including pediatricians ($n = 41$), gynecologists ($n = 41$), and nurses ($n = 62$) working in these NICUs were recruited and they were all Muslims. The list of healthcare staff working in the NICUs was provided and they were invited to take part in the study, with no one declining to participate.

Data collection

Data were collected using the demographic characteristics form consisting of questions about the participants' gender, marital status, work experience, history of encountering neonates with poor prognosis, history of having a severely ill neonate in the family/relatives and the type of workplace.

Also, the 15-item questionnaire of healthcare professionals' attitude about the value of life was used. This questionnaire was developed based on the Eouronic's study,[6] and was translated through the forward and backward translation method. Also, its content validity was assessed by 10 faculty members consisting of neonatologists, social medicine and medical ethics specialists affiliated with the university in which the corresponding author (SR) worked. The list of the questions were as follows: (1) because the human life is sacred, everything should be done to ensure the neonate's survival, even if his/her prognosis is poor; (2) even with a severe physical disability, life is better than no life at all; (3) even with severe mental disability, life is always better than no life at all; (4) stopping the provision of intensive care, even in special situations, is a 'slippery slope' that can lead to abuse; (5) intensive care is 'slippery slope' and likely leads to therapeutic aggressiveness; (6) the burden of disabled childcare on the family is not considered, when an ethical decision is made; (7) there is no room for making an ethical decision when the law does not allow to limit therapeutic measures; (8) every neonate should be provided with the best intensive care irrespective of the outcome, because the acquired clinical experience can benefit other neonates in the future; (9) increasing the cost of care hinders healthcare staff to treat each neonate regardless of the outcome; (10) there is no difference between the discontinuance of intensive care and administration of drugs with the purpose of ending the neonate's life; (11) there is no difference between discontinuance and withholding of intensive care from the ethical perspective; (12) withholding intensive care without simultaneously taking active measures to end the neonate's life is dangerous, because it makes it more likely that the neonate will be severely disabled, if he/she survives; (13) given the Islamic justice and limitations in intensive care equipment, my religious belief allows me acting out for terminating intensive care such as the discontinuation of mechanical ventilation or discontinuation of vital medicines in certain cases;

(14) given the Islamic justice and limitation in intensive care equipment, my ethical belief allows me, acting out for the termination of intensive care such as the discontinuation of mechanical ventilation or discontinuation of vital medicines in the certain cases; (15) my religious belief is always the most important in making the decision for the discontinuance of intensive care.

For reliability, the Cronbach's alpha coefficient of the questionnaire was calculated using a pilot test with 20 healthcare providers and was reported 0.82. This questionnaire had a five-point Likert scale and the score range of questions 1 to 10 was from 0 to 4 as follows: strongly agree =4, agree =3, no idea (I do not care) =2, disagree = 1 and strongly disagree =0. For questions 5, 9, 13, 14, it had a reverse scoring. The higher score indicated a more positive attitude about the value of life. For standardization, the total score was multiplied to 25 and was divided to 15 as the number of questions. Therefore, a score between 0 and 100 was achieved with a higher score indicating a higher attitude toward the value of life.

The third tool was a researcher-made questionnaire consisting of questions about factors influencing the healthcare providers' decisions to provide care to neonates with poor prognosis including gestational age, weigh at birth, parents' marital status, family's socioeconomic condition, type of neonate disease, response of laboratory tests, physician's prediction of neonate prognosis, presence of abnormalities against the neonate life, consultant physician's comment, hospital therapeutic protocols, standard of neonatal association, expectations of the mortality committee, and religious beliefs. They were asked to show their agreement on the five-point Likert scale from completely agree (score 4) to completely disagree (score 0). Also, three case studies for starting and discontinuation of resuscitation and intensive care in four groups of neonates with poor prognosis including low age at birth (<25 weeks), weight below 1000 g, multiple congenital anomalies, and asphyxia, with implications for clinical ethics were designed as follows:

A. You are present in the delivery room and a neonate is born with a gestational age of 26 weeks. The neonate starts crying, but has a weak cry sound. The heart rate is reported 100 beats per minute. The infant is limp, its eyes are closed, and its skin is thin and transparent. Its weight is approximately between 550 and 600 gr.

B. Due to the long-term umbilical cord prolapse, a neonate is born at a gestational age of 37 weeks with a weight of 2900 g. The neonate's shape is normal at birth, but he/she is limp, has low muscle tone with cyanosis. The neonate cannot breath by herself/himself. Cardiopulmonary resuscitation is performed and the neonate is transferred to the NICU. After 25 days, he/she is suffering from severe neurological injuries, but has a few spontaneous movements, and ischemic changes are shown on brain imaging. The neonate cannot feed orally owing to the absent of sucking and gaging reflexes. The neurologist reports a little chance of long-term survival and no chance of functional development.

C. After a natural delivery, a 35-week neonate is transferred to the NICU. He/she has clear manifestations of trisomy 18 including low-set and malformed ears, prominent occiput, micrognathia, cleft palate and cyanotic congenital heart disease. This diagnosis is confirmed using the chromosomal analysis.

These case scenarios were drawn from medical ethics practice and were confirmed in terms of validity by a team of experts consisting of neonatologists, social medicine and medical ethics experts. The participants were asked to show their agreement and disagreement with therapeutic measures that they would approve with respect to these three cases scenarios including 'aggressive care', 'conservative care', or 'palliative care' approaches. Aggressive care meant all necessary, practical measures that must be taken to preserve neonate's life including the initiation or continuation of mechanical ventilation, medication to preserve and protect the functions of vital organs, and even surgery. Conservative care was related to the initiation and continuation of a limited number of treatment modalities for neonates such as administration of oxygen through noninvasive methods, suctioning and feeding. It did not consider invasive measures such as intubation, mechanical ventilation or surgery. Palliative care consisted of the application of no interventions except those aiming at warming or comforting the neonate.[19,20] The participants were asked to show their agreement on the use of each therapeutic measure on a five-point Liker scale from completely agree (score 4) to completely disagree (score 0). To facilitate the interpretation of findings, the scores of completely agree and agree were summed together and the summation of other options' scores was considered disagree.

Data analysis

Descriptive and inferential statistics were used for data analysis. The Chi-square test, Fisher's exact test, Cohen's d test, Kruskal–Wallis test, and Dunn test were used for the comparison of findings between the participants' groups. The Kolmogorov-Smirnov test was used to assess the normal distribution of data. The data analysis was performed via the SPSS software

version 16 and a $p < 0.05$ was considered statistically significant.

Results

In this study, 144 healthcare providers participated; their demographic characteristics are presented in Table 1. Accordingly, 41 (28.5%) were gynecologists, 41 (28.5%) were pediatricians and 62 (43.1%) were nurses. The majority of the gynecologists and pediatricians (43.1%) and the nurses (32.6%) were female. The gynecologists and pediatricians (52.8%), and nurses (35.4%) more than five times encountered severely ill neonates during their work career. The majority of the participants (65.3%) worked in public hospitals as follows: gynecologists (18.8%), pediatricians (14.6%), and nurses (31.9%). The gynecologists (13.9%) and the nurses (20.1%) had the work experience of 6–15 years, but the pediatricians had the work experience from 6 years and above it (22.2%). No statistically significant differences were reported between the participants in terms of the demographic variables ($p > 0.05$).

The number and percentage of the participants' positive and negative agreement on the no initiation of resuscitation measures and the discontinuation of resuscitation in neonates with poor prognosis is shown in Table 2. Accordingly, the negative agreement was more than the positive agreement ($p = 0.001$), and the severity of the related effect was reported moderate ($d = 0.55$ and 0.60, respectively).

Factors influencing decision making by the participants for the provision of different types of care were studied and the mean scores of agreement were compared between the healthcare disciplines (Table 3). Accordingly, the mean scores of agreement had statistically significant differences between the pediatricians and the nurses in terms of the physician's prediction of neonate prognosis ($p = 0.001$) and the higher mean score belonged to the nurses (3.11). Also, the mean scores of agreement between the pediatricians (2.98) and the nurses (3.42) had statistically significant differences in terms of the presence of abnormalities against the neonate life ($p = 0.03$). The factor of the consultant physician's comment showed statistically significant differences ($p = 0.03$) between the pediatricians (2.51) and the nurses (2.31). In terms of religious beliefs, the mean score of agreement between the gynecologists (3.07) and the pediatricians (3.41) had statistically significant differences ($p = 0.02$).

Relationships between the mean score of the participants' attitude about the value of life and demographic variables are shown in Table 4. Given between-group comparisons, female gender, being married ($p = 0.001$), public type of workplace ($p = 0.003$) and history of having a severely ill neonate in the family/relatives ($p = 0.002$) had statistically significant relationships with the attitude about the value of life between the gynecologists and the nurses, and higher mean scores belonged to the gynecologists.

Table 1. The demographic characteristics of the participants in work disciplines ($n = 144$).

	Work discipline				
Variable	Gynecologist ($n = 41$), n (%)	Pediatrician ($n = 41$), n (%)	Nurse ($n = 62$), n (%)	Total	Test, p-value
Gender					
Male	20 (13.8)		15 (10.5)	35 (24.3)	Fisher's Exact Test, $p = 0.99$
Female	62 (43.1)		47 (32.6)	109 (75.7)	
Work experience, y					
1–5	8 (5.6)	9 (6.2)	13 (9)	30 (20.8)	$X^2(4) = 0.97$
6–15	20 (13.9)	16 (11.1)	29 (20.1)	65 (45.1)	$p = 0.91$
>16	13 (9)	16 (11.1)	20 (13.9)	49 (34)	
Marital status					
Single	3 (2.1)	8 (5.6)	16 (11.1)	27 (18.8)	$X^2(4) = 0.97$
Married	38 (26.4)	33 (22.9)	46 (32)	117 (81.2)	$p = 0.91$
History of encountering severely ill neonates					
<5	6 (4.2)		11 (7.6)	17 (11.8)	Fisher's Exact Test, $p = 0.06$
>5	76 (52.8)		51 (35.4)	127 (88.2)	
Having a severely ill neonate in the family/relatives					
Yes	32 (22.2%)	32 (22.2%)	47 (32.6)	111 (77.1)	$X^2(4) = 0.99$
No	9 (6.2)	9 (6.2)	15 (10.4)	33 (22.9)	$p = 0.95$
Type of workplace					
Public	27 (18.8)	21 (14.6)	46 (31.9)	94 (65.3)	$X^2(2) = 5.75$
Private	14 (9.7)	20 (13.9)	16 (11.1)	50 (34.7)	$p = 0.056$

Table 2. The frequency and percentage of the participants' agreement on the no initiation of resuscitation and the discontinuation of resuscitation in four groups of neonates with poor prognosis.

	Neonates with poor prognosis					
Agreement levels, *n* (%)	Weight <1000 gr	Asphyxia	Multiple congenital anomalies	Low age at birth (<25 weeks)	Total	Test, *p* value
Agreement on the no initiation of resuscitation						$\chi^2(3) = 41.35$, $p = 0.001$,
Positive	14 (2.4)	48 (8.3)	59 (10.2)	29 (5)	150 (26)	Cohen's d= 0.55, r = 0.26
Negative	130 (22.6)	96 (16.7)	85 (14.8)	115 (20)	426 (74)	
Agreement on the discontinuation of resuscitation						$\chi^2(3) = 48.50$
Positive	63 (10.9)	69 (12)	91 (15.8)	50 (8.7)	273 (47.4)	$p = 0.001$,
Negative	81 (14.1)	75 (13)	53 (9.2)	94 (16.3)	303 (52.6)	Cohen's d= 0.60, r = 0.29

The mean scores of the participants' agreement and disagreement with decision making on the case scenarios are presented in Table 5. For neonates with age at birth below 25 weeks, the participants mainly agreed on aggressive care (57.49) and disagreed on palliative care (55.39) and conservative care (55.30). For neonates with asphyxia, the participants reported the highest agreement on aggressive care (60.35) and disagreed on conservative care (58.40) and palliative care (55.92). Also, for neonates with multiple congenital anomalies, the participants agreed mainly on aggressive care (62.01), but they mostly disagreed on conservative care (63.20) and palliative care (62.55).

Discussion

This was the first Iranian study to investigate and compare the attitudes of healthcare providers about the value of life and decision making when encountering neonates with poor prognosis in the NICU.

According to the findings, the participants reported an agreement on the initiation of intensive care for neonates with poor prognosis indicating the attitude of value or sacredness of life. This finding was in line with the findings of the Ghaffari's study in Sari City, Iran and the Bilgin's study in Turkey.[3,18] Conversely, the Rebagliato's study in 10 European countries reported that the approach of quality of life was more common and participants preferred to provide care to those neonates that would enjoy a higher quality life in the future. They also reported that the attitudes of European neonatologists about the sacredness of life vs. quality of life varied within and across participants in 10 European countries,[7] indicating the effect of religion and culture on their attitudes and perspectives.

The participants of this study mainly agreed that everything possible should be done to improve neonate's survival, even if he/she had a poor prognosis, supporting the value or sacredness of life. Similarly, 75% of responders in the study in Turkey agreed with this statement, but only 33% of physicians in Italy, 25% in Lithuania, and 24% in Hungary, agreed with it.[7,18]

Our study showed a statistically significant difference between the nurses' and physicians' perspectives regarding end-of-life decision makings. A study in Switzerland showed differences between nurses' and physicians' perspectives regarding end-of-life decision making for extremely preterm infants.[21]

The participants in this study with various frequencies agreed on the provision of aggressive, conservative, and palliative care to neonates with poor prognosis. Nayeri *et al.* in Iran showed that participants agreed on the use of advanced invasive methods to save the life of premature neonates.[20] Some healthcare providers may consider that premature neonates have positive prognosis, and all facilities should be used for improving their survival. Others may consider that neonates with severe asphyxia and congenital anomaly do not have favorable prognosis. The results of this study showed the high agreement on the use of aggressive measures for neonates with poor prognosis, especially for infants with age at birth below 25 weeks, which was consistent with the results of studies in Iran, Taiwan, Oman, Turkey[3,5,10,18] and was converse with the study conducted in the USA.[22]

It is inferred from the findings of this study that the participants supported the use of all therapeutic measures for neonates with poor prognosis, which was against the perspective of active euthanasia in clinical practice. While withholding and withdrawing intensive neonatal care in the UK is not uncommon,[17] the British Medical Association repeatedly reinforces the rejection of active euthanasia.[23] Active euthanasia appears to be an acceptable intervention in the Netherlands, France, and Lithuania, but it is less accepted in Sweden, Hungary, Italy, and Spain. Half of physicians in the Netherlands and a quarter in France feel that active euthanasia should be supported by the law.[24] A study

Table 3. Factors influencing the decision made by the participants to provide care to neonates with poor prognosis.

Variable	Group	Minimum-maximum	Mean ± SD	Kolmogorov-Smirnov test	Mean Rank	Test, *p* value
Neonates' gestational age	(1) Gynecologist ($n=41$)	0–4	2.85 ± 1.38	Z = 1.72, $p=0.004$	76.74	Kruskal–Wallis H(2) = 0.77, $p=0.68$
	(2) Pediatrician ($n=41$)	0–4	2.76 ± 1.33	Z = 1.47, $p=0.02$	72.48	
	(3) Nurse ($n=62$)	0–4	2.69 ± 1.31	Z = 2.25, $p=0.001$	69.71	
	Total ($n=144$)	0–4	2.76 ± 1.33	Median=3		
Weight at birth	(1) Gynecologist ($n=41$)	0–4	2.54 ± 1.50	Z = 1.63, $p=0.01$	76.74	Kruskal–Wallis H(2) = 0.46, $p=0.79$
	(2) Pediatrician ($n=41$)	0–4	2.54 ± 1.58	Z = 1.52, $p=0.02$	72.48	
	(3) Nurse ($n=62$)	0–4	2.42 ± 1.47	Z = 2.09, $p=0.001$	69.71	
	Total ($n=144$)	0–4	2.76 ± 1.33	Median=3		
Parents' marital status	(1) Gynecologist ($n=41$)	0–4	0.95 ± 1.16	Z = 1.95, $p=0.01$	70.71	Kruskal–Wallis H(2) = 0.63, $p=0.72$
	(2) Pediatrician ($n=41$)	0–3	0.80 ± 0.81	Z = 1.62, $p=0.01$	69.82	
	(3) Nurse ($n=62$)	0–3	0.95 ± 0.89	Z = 2.11, $p=0.001$	75.46	
	Total ($n=144$)	0–4	0.95 ± 0.83	Median=1		
Family's socio-economic condition	(1) Gynecologist ($n=41$)	0–4	1.05 ± 1.04	Z = 1.48, $p=0.02$	67.09	Kruskal–Wallis H(2) = 1.15, $p=0.56$
	(2) Pediatrician ($n=41$)	0–3	1.15 ± 0.88	Z = 1.28, $p=0.07$	73.21	
	(3) Nurse ($n=62$)	0–3	1.24 ± 0.97	Z = 2.17, $p=0.001$	75.61	
	Total ($n=144$)	0–4	1.16 ± 0.96	Median=1		
Type of the neonate disease	(1) Gynecologist ($n=41$)	1–4	3.15 ± 0.79	Z = 1.48, $p=0.02$	68.61	Kruskal–Wallis H(2) = 3.36, $p=0.18$
	(2) Pediatrician ($n=41$)	0–4	2.93 ± 1.19	Z = 1.63, $p=0.01$	66.20	
	(3) Nurse ($n=62$)	0–4	3.29 ± 0.99	Z = 2.44, $p=0.001$	79.24	
	Total ($n=144$)	0–4	3.15 ± 1.01	Median=3		
Response of laboratory tests	(1) Gynecologist ($n=41$)	1–4	3.24 ± 0.79	Z = 1.70, $p=0.006$	73.62	Kruskal–Wallis H(2) = 4.46, $p=0.10$
	(2) Pediatrician (n=41)	1–4	2.90 ± 1.04	Z = 1.40, $p=0.03$	62.17	
	(3) Nurse ($n=62$)	1–4	3.31 ± 0.89	Z = 2.45, $p=0.001$	78.59	
	Total ($n=144$)	1–4	3.17 ± 0.92	Median=3		
Physician's prediction of the neonate prognosis	(1) Gynecologist ($n=41$)	0–4	2.93 ± 0.98	Z = 1.82, $p=0.002$	69.57	Kruskal–Wallis H(2) = 16.63, $p=0.001$ Dunn test, Adj.P group1 *vs.* group2, $p=0.24$ group1 *vs.* group3, $p=0.10$ group2 *vs.* group3 $p=0.001$
	(2) Pediatrician ($n=41$)	0–4	2.54 ± 0.97	Z = 2.02, $p=0.001$	54.30	
	(3) Nurse ($n=62$)	0–4	3.11 ± 1.43	Z = 2.96, $p=0.001$	86.47	
	Total ($n=144$)	0–4	2.90 ± 1.21	Median=3		

(continued)

Table 3. Continued.

Variable	Group	Minimum-maximum	Mean ± SD	Kolmogorov-Smirnov test	Mean Rank	Test, *p* value
Presence of abnormalities against the neonate life	(1) Gynecologist ($n=41$)	0–4	3.32 ± 1.12	Z = 2.62, $p=0.001$	72.48	Kruskal–Wallis H(2) = 6.32, $p=0.04$
	(2) Pediatrician ($n=41$)	0–4	2.98 ± 1.27	Z = 2.08, $p=0.001$	62.24	Dunn test, Adj.P
	(3) Nurse ($n=62$)	0–4	3.42 ± 1.27	Z = 3.92, $p=0.001$	79.30	Group 1 *vs.* Group 2, p =0.50
	Total ($n=144$)	0–4	3.26 ± 1.24	Median=4		Group 1 *vs.* Group 3, $p=0.94$ Group 2 *vs.* Group 3 $p=0.03$
Consultant physician's comment	(1) Gynecologist ($n=41$)	0–4	2.07 ± 0.84	Z = 2.35, $p=0.001$	57.72	Kruskal–Wallis H(2) = 8.31,
	(2) Pediatrician ($n=41$)	0–4	2.51 ± 1.16	Z = 1.33, $p=0.05$	79.39	$p=0.01$ Dunn test, Adj.P
	(3) Nurse ($n=62$)	0–3	2.31 ± 1.13	Z = 3.07, $p=0.001$	77.72	Group 1 *vs.* Group 2, $p=0.50$
	Total ($n=144$)	0–4	2.30 ± 1.07	Median=2.5		Group 1 *vs.* Group 3, $p=0.94$ Group 2 *vs.* Group 3 $p=0.03$
Hospital's therapeutic protocols	(1) Gynecologist ($n=41$)	0–4	2.29 ± 1.03	Z = 1.86, $p=0.002$	64.45	Kruskal–Wallis H(2) = 2.37,
	(2) Pediatrician ($n=41$)	0–4	2.51 ± 1.22	Z = 1.38, $p=0.04$	75.94	$p=0.30$
	(3) Nurse ($n=62$)	0–4	2.39 ± 1.21	Z = 2.78, $p=0.001$	75.55	
	Total ($n=144$)	0–4	2.40 ± 1.16	(Median)=3		
Standards of neonatal association	(1) Gynecologist ($n=41$)	0–4	3.39 ± 1.22	Z = 2.55, $p=0.001$	77.90	Kruskal–Wallis H(2) = 3.11,
	(2) Pediatrician ($n=41$)	0–4	2.88 ± 1.48	Z = 1.99, $p=0.001$	64.65	$p=0.21$
	(3) Nurse ($n=62$)	0–4	3.10 ± 1.54	Z = 3.26, $p=0.001$	74.12	
	Total ($n=144$)	0–4	3.12 ± 1.44	Median=4		
Expectations of the mortality committee	(1) Gynecologist ($n=41$)	0–4	2.73 ± 0.94	Z = 3.13, $p=0.001$	77.90	Kruskal–Wallis H(2) = 5.13,
	(2) Pediatrician ($n=41$)	0–4	2.85 ± 1.52	Z = 2.30, $p=0.001$	64.65	$p=0.07$
	(3) Nurse ($n=62$)	0–4	2.58 ± 1.30	Z = 3.02, $p=0.001$	74.12	
	Total ($n=144$)	0–4	2.70 ± 1.28	Median=3		
Religious beliefs	(1) Gynecologist ($n=41$)	0–4	3.07 ± 1.14	Z = 2.25, $p=0.001$	61.88	Kruskal–Wallis H(2) = 6.78,
	(2) Pediatrician ($n=41$)	0–4	3.41 ± 1.24	Z = 2.79, $p=0.001$	82.99	$p=0.03$ Dunn test, Adj.*P*
	(3) Nurse ($n=62$)	0–4	3.03 ± 1.52	Z = 2.88, $p=0.001$	72.59	Group 1 *vs.* Group 2, $p=0.02$
	Total ($n=144$)	0–4	3.15 ± 1.35	Median=4		Group 1 *vs.* Group 3, $p=0.44$ Group 2 *vs.* Group 3 $p=0.47$

Table 4. Relationships between the participants' attitudes toward the value of life and their demographic characteristics.

Variable	Group	Minimum–maximum	Mean ± SD	Kolmogorov-Smirnov test	Test, *p* value
Gender, female	(1) Gynecologist ($n=41$)	23.33–76.67	60.08 ± 13.87	$Z=1.33$, $p=0.05$	ANOVA
	(2) Pediatrician ($n=21$)	18.33–70	54.60 ± 12.98	$Z=1.008$, $P=0.26$	p (Levene statistics) = 0.47
	(3) Nurse ($n=47$)	20–68.33	48.61 ± 10.90	$Z=1.46$, $p=0.02$	$F(2,106)=9.24$, $p=0.001$
					Post Hoc.Scheffe
					Group 1 vs. Group 2, $p=0.26$
					Group 1 *vs.* Group 3, $p=0.001$
					Group 2 vs. Group 3 p =0.19
Gender, male	(2) Pediatrician ($n=20$)	21.67–66.67	51.83 ± 11.05	$Z=1.09$, $p=0.18$	Levene statistics
	(3) Nurse ($n=15$)	23.33–70	51.22 ± 12.04	$Z=1.005$, $p=0.26$	$F(33)=0.01$, $p=0.91$
					Independent *t*-test
					$T(33)=0.12$, $p=0.87$
Marital status, single	(1) Gynecologist ($n=3$)	60–76.67	68.33 ± 8.33	$Z=0.30$, $p=0.99$	ANOVA
	(2) Pediatrician ($n=8$)	21.67–66.67	53.54 ± 13.58	$Z=0.90$, $p=0.38$	p (Levene statistics) = 0.89
	(3) Nurse ($n=16$)	23.33–70	51.87 ± 11.92	$Z=1$, $p=0.27$	$F(2,24)=2.32$, $p=0.12$
Marital status, married	(1) Gynecologist ($n=38$)	23.33–76.67	59.42 ± 14.08	$Z=1.30$, $p=0.06$	ANOVA
	(2) Pediatrician ($n=33$)	18.33–70	53.18 ± 11.83	$Z=1.21$, $p=0.10$	p (Levene statistics) = 0.38
	(3) Nurse ($n=46$)	20–68.33	48.33 ± 10.84	$Z=1.47$, $p=0.02$	$F(2,114)=8.53$, $p=0.001$
					Post Hoc.Scheffe
					Group 1 vs. Group 2, $p=0.10$
					Group 1 vs. Group 3, $p=0.001$
					Group 2 vs. Group 3 $p=0.22$
Type of workplace, public	(1) Gynecologist ($n=27$)	23.33–76.67	59.44 ± 14.75	$Z=1.28$, $p=0.07$	ANOVA
	(2) Pediatrician ($n=21$)	21.67–70	52.68 ± 11.48	$Z=1.03$, $p=0.23$	p (Levene statistics) = 0.50
	(3) Nurse ($n=46$)	23.33–70	48.95 ± 11.01	$Z=1.57$, $p=0.01$	$F(2,93)=6.15$, $p=0.003$
					Post Hoc.Scheffe
					Group 1 vs. Group 2, $p=0.17$
					Group 1 vs. Group 3, $p=0.003$
					Group 2 vs. Group 3 $p=0.52$
Type of workplace, private	(1) Gynecologist ($n=14$)	30–76.67	61.30 ± 12.42	$Z=0.58$, $p=0.20$	ANOVA
	(2) Pediatrician ($n=20$)	18.33–66.67	53.83 ± 12.82	$Z=1.04$, $p=0.22$	p (Levene statistics) = 0.82
	(3) Nurse ($n=16$)	20–68.33	49.99 ± 11.83	$Z=1.02$, $p=0.24$	$F(2,47)=3.18$, $p=0.05$
History of having a severely ill neonate in the family/ relatives, yes	(1) Gynecologist ($n=32$)	23.33–76.67	59.16 ± 14.72	$Z=1.38$, $p=0.04$	ANOVA
	(2) Pediatrician ($n=32$)	21.67–70	53.80 ± 10.69	$Z=1.32$, $p=0.06$	p (Levene statistics) = 0.27
	(3) Nurse ($n=47$)	23.33–70	49.07 ± 10.91	$Z=1.61$, $p=0.01$	$F(2,108)=6.67$, $p=0.002$
					Post Hoc.Scheffe
					Group 1 vs. Group 2, $p=0.21$
					Group 1 vs. Group 3, $p=0.002$
					Group 2 vs. Group 3 $p=0.23$
History of having a severely ill neonate in the family/relatives, no	(1) Gynecologist ($n=9$)	43.33–76.67	63.33 ± 10.34	$Z=0.50$, $p=0.96$	p (Levene statistics) = 0.42
	(2) Pediatrician ($n=9$)	18.33 ± 66.67	51.29 ± 16.51	$Z=0.76$, $p=0.59$	$F(2,30)=3.26$, $p=0.05$
	(3) Nurse ($n=15$)	20–68.33	49.77 ± 12.21	$Z=0.97$, $p=0.29$	

in Belgium suggested that in certain cases, interventions that hasten death could be permitted. Also, most physicians favored the legalization of the use of lethal drugs in some cases in Belgium.[25] A study in the Netherlands suggested that treatment should generally be considered conditional and if the treatment fails, it could be abandoned.[26] It is noted that for all healthcare providers who have the decisive role in end of life

Table 5. Comparison of the mean scores of the perspectives of the participants regarding their agreement or disagreement with care proposed for each case scenario.

Case scenario	Perspective	Minimum–maximum	Mean ± SD	Kolmogorov-Smirnov test	Test, *p* value
A. Neonate with age at birth below 25 weeks	Aggressive care/agree ($n = 119$)	28.33–76.67	57.49 ± 8.67	$Z = 0.92$, $p = 0.36$	Independent *t*-test $T(28.71) = 8.57$, $p = 0.001$
	Aggressive care/disagree ($n = 25$)	18.33–65	34.33 ± 12.90	$Z = 0.85$, $p = 0.49$	
	Conservative care/agree ($n = 44$)	18.33–76.67	49.31 ± 18.35	$Z = 0.85$, $p = 0.45$	Independent *t*-test $T(52.73) = -2.05$, $p = 0.04$
	Conservative care/disagree ($n = 100$)	23.33–76.67	55.30 ± 9.19	$Z = 1.52$, $p = 0.01$	
	Palliative care/agree ($n = 31$)	20–76.67	46.45 ± 17.45	$Z = 0.83$, $p = 0.49$	Independent *t*-test $T(36.42) = -2.71$, $p = 0.01$
	Palliative care/disagree ($n = 113$)	18.33–76.67	55.39 ± 10.71	$Z = 1.66$, $p = 0.008$	
B. Neonate with asphyxia	Aggressive care/agree ($n = 79$)	20–76.67	60.35 ± 8.92	$Z = 0.88$, $p = 0.42$	Independent *t*-test $T(114.8) = 8.42$, $p = 0.001$
	Aggressive care/disagree ($n = 65$)	18.33–65	45.10 ± 12.14	$Z = 1.82$, $p = 0.003$	
	Conservative care/agree ($n = 95$)	18.33–76.67	50.92 ± 14.27	$Z = 1.80$, $p = 0.002$	Independent *t*-test $T(141.3) = -4.04$, $p = 0.001$
	Conservative care/disagree ($n = 49$)	45–76.67	58.40 ± 7.89	$Z = 0.95$, $p = 0.32$	
	Palliative care/agree ($n = 81$)	20–76.67	51.56 ± 12.64	$Z = 1.72$, $p = 0.005$	Independent *t*-test $T(142) = -2.02$, $p = 0.04$
	Palliative care/disagree ($n = 63$)	18.33–76.67	55.92 ± 12.99	$Z = 1.18$, $p = 0.11$	
C. Neonate with multiple congenital anomalies	Aggressive care/agree ($n = 72$)	50–76.67	62.01 ± 6.21	$Z = 1.31$, $p = 0.06$	Independent *t*-test $T(105.09) = 10.53$, $p = 0.001$
	Aggressive care/disagree ($n = 72$)	18.33 ± 70	44.93 ± 12.27	$Z = 1.83$, $p = 0.002$	
	Conservative care/agree ($n = 90$)	18.33–73.33	47.62 ± 12.41	$Z = 2.08$, $p = 0.001$	Independent *t*-test $T(138.1) = -10.01$, $p = 0.001$
	Conservative care/disagree ($n = 54$)	50–76.67	63.20 ± 6.18	$Z = 1.18$, $p = 0.12$	
	Palliative care/agree ($n = 81$)	18.33–71.67	45.99 ± 12.15	$Z = 1.99$, $p = 0.001$	Independent *t*-test $T(122.5) = -10.47$, $p = 0.001$
	Palliative care/disagree ($n = 63$)	50–76.67	62.55 ± 6.40	$Z = 1.06$, $p = 0.20$	

decisions, euthanasia and decision making on the provision of care can create serious ethical problems[27] and needs to be discussed in more details in future studies.

Conclusion

The participants in this study mostly favored the value or sacredness of life and agreed on the use of all therapeutic measures for saving the lives of neonates with poor prognosis. It shows that ethical decisions made by them are influenced by their attitudes that directly impact on the provision of care to neonates in the NICU. To prevent conflicts during decision making and improve the atmosphere of teamwork in clinical practice, hospitals should set up a multi-specialized ethical committee for resolving ethical dilemmas and facilitate decision making on complicated cases, especially in developing countries in which insufficient numbers of physicians and nurses and inadequate equipment encourage healthcare providers to prioritize care and treatment to those who have a better chance of survival. Further studies with a larger sample size using direct observations are needed to support the findings of this study. Also, future qualitative studies can help with the improvement of our understandings of factors influencing ethical decision makings when encountering neonates with poor prognosis in NICUs.

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Ethical considerations

The process of data collection was anonymous and did not involve the real treatment process of neonates in the NICUs. The participants signed the written consent form before commencing the study.

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References

1. . Sundean LJ and McGrath JM. Ethical considerations in the neonatal intensive care unit. *Newborn Infant Nurs Rev Points* 2013; **13**: 117–120.
2. Kadivar M, Mosayebi Z, Asghari F, *et al*. Ethical challenges in the neonatal intensive care units: perceptions of physicians and nurses; an Iranian experience. *J Med Ethics Hist Med* 2015; F1–F8.
3. Ghaffari Saravi V, Zarghami M, Sheikh Moonesi F, *et al*. Viewpoint and practice of pediatrics and gynecology physicians in the cities of Sari and Babol regarding non-initiation and discontinuation of resuscitation in cases of gravely ill newborns. *J Mazandaran Univ Med Sci* 2007; **19**: 33–40. [in Persian]
4. Verhaegen E and Sauer PJ. The Groningen Protocol-Euthanasia in severely ill newborns. *N Engl J Med* 2005; **352**: 959–962.
5. Huang LC, Chen CH, Liu HL, *et al*. The viewpoints of neonatal professionals about end-of-life decision-making for dying infant in Taiwan. *J Med Ethics* 2013; **39**: 382–386.
6. Kliegman RM, Behrman RE, Janson HB, *et al*. Ethics in pediatrics care. In: *Nelson Text Book of Pediatrics*. 20th ed. Philadelphia, PA: Elsevier Health Sciences, 2016, pp.27–30.
7. Rebagliato M, Cuttini M, Broggin L, *et al*. Physicians' viewpoints and relationship with self-reported practices in 10 European countries. *JAMA* 2000; **284**: 2451–2459.
8. Cuttini M, Casotto V and Orzalesi M. Ethical issues in neonatal intensive care and physicians' practices: a European perspective. *Acta Paediatr Suppl* 2006; **95**: 42–46.
9. Owen K. Taking courage: neonatal euthanasia and ethical leadership. *Nurs Ethics* 2018: 1–5.
10. Costa D, Ghazal H and Khusiaby S. Do not resuscitate orders and ethical decisions in a neonatal intensive care unit in a Muslim community. *Arch Dis Child Fetal Neonatal* 2002; **86**: 115–119.
11. Mobasher M, Aramesh K, Zahedi F, *et al*. End-of-life care ethical decision-making: Shiite scholars' views. *J Med Ethics Hist* 2014; **7**: 2–11.
12. Zahedi F, Larijani B and Tavakoly Bazzaz J. end of life ethical issues and Islamic viewpoints. *Iran J Allergy Asthma Immunol* 2007; **6**: 5–15.
13. Aghabarary M and Dehghan Nayeri N. Medical futility and its challenges: a review study. *J Med Ethics Hist* 2016; **9**: 11.
14. Moghadasian S, Abdollahzadeh F, Rahmani A, *et al*. Do not resuscitate order: viewpoint of nursing students of Tabriz and Kurdistan Universities of Medical Sciences. *J History Med Ethics* 2015; 45: 56. [in Persian]
15. Strandås M and Fredriksen ST. Ethical challenges in neonatal intensive care nursing. *Nurs Ethics* 2015; **22**: 901–912. Dec;
16. Pasarón R. Neonatal bioethical perspectives: practice considerations Neonatal Netw. *Nurs Ethics* 2013; **32**: 184–192.
17. Warrick C, Perera L, Murdoch E, *et al*. Guidance for withdrawal and withholding of intensive care as part of neonatal end-of-life care. *Br Med Bull* 2011; **98**: 99–113.
18. Bilgen H, Topuzoglu A, Kuscu K, *et al*. End-of-life decisions in the newborn period: viewpoints and practices of doctors and nurses. *Turkish J Pediatr* 2009; **51**: 248–256.
19. Raines DA. Choices of neonatal nurses in ambiguous clinical situations. *Neonatal Netw* 1996; **15**: 17–25.
20. Nayeri F, Asghari F, Baser A, *et al*. Viewpoints and decisions of physicians in encountering neonates with poor prognosis. *Arch Iran Med* 2017; **20**: 172–177.
21. Bucher HU, Klein SD, Hendriks MJ, *et al*. Decision-making at the limit of viability: differing perceptions and opinions between neonatal physicians and nurses. Swiss Neonatal End-of-Life Study Group. *BMC Pediatr* 2018; **118**: 1–9.
22. Feltman DM and Leuthner SR. Survey of neonatologists' viewpoints about limiting life-sustaining treatments in the neonatal intensive care unit. *J Perinatol* 2012; **32**: 886–892.
23. British Medical Association. Physician-assisted dying: BMA policy, 2019, https://www.bma.org.uk/advice/employment/ethics/ethics-a-to-z/physician-assisted-dying (accessed 16 July 2019).
24. Cuttini M, Casotto V and Kaminski M. Should euthanasia be legal? An international survey of neonatal intensive care unit staff. *Arch Dis Child Fetal Neonatal* 2004; **89**: 19–24.
25. Provoost V, Cools F, Mortier F, *et al*. Medical end-of-life decisions in neonates and infants in Flanders. Neonatal Intensive Care Consortium. *Lancet* 2005; **365**: 1315–1320.
26. Willems DL, Verhagen AA and van Wijlick E. Infants' best interests in end-of life care for newborns. *Pediatrics* 2014; **134**: 1163–1168.
27. Yıldız E. Ethics in nursing: A systematic review of the framework of evidence perspective. *Nurs Ethics* 2019; **26**: 1128–1148.