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Research Paper

The Effect of an Educational Intervention Based on Gratitude on the Stress and Mental Health of Mothers of Preterm Infants Hospitalized in a Neonatal Intensive Care Unit

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ABSTRACT

Background and Objectives: One of the non-pharmacological interventions is gratitude, which has received less attention in the neonatal intensive care unit (NICU). The present study was conducted to investigate the effect of an educational intervention based on gratitude on the stress and mental health of mothers with preterm infants hospitalized in the NICU.

Methods: A quasi-experimental controlled study was conducted on 50 mothers with infants hospitalized in the NICU of Shahrekord City, Iran, who were divided into two intervention and control groups. The intervention group was trained by the researcher in three two-hour sessions every week for two weeks. The results related to mothers' general health and stress were analyzed by the parental stress questionnaire and Goldberg and Hiller's general health questionnaire (GHQ-28) before and after the intervention by the paired t-test.

Results: The mean stress score of mothers in the intervention group significantly reduced ($P<0.001$). Stress was reduced in the mothers of the control group who only received routine training, but this reduction was not statistically significant ($P>0.05$) (before training: 35.72 and after training: 34.08). In the intervention group, the mean score of mental health improved significantly two weeks after the gratitude-based training program ($P<0.05$) (before training: 26.56 and after training: 19.20).

Conclusion: This is the first study on the effectiveness of gratitude on the health of Iranian mothers with preterm infants hospitalized in the NICU. Gratitude improves the stress level and increases the quality of mental health. The belief that gratitude will increase blessings is a crucial part of Iranian women's religious beliefs and is a critical factor in the effectiveness of mind and body interventions.

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Introduction

The neonatal intensive care unit (NICU) is a part of the hospital where nurses take care of preterm infants and infants with heart abnormalities and other functional or morphological problems [1]. Having an infant hospitalized in this ward is a stressful experience for mothers, which is due to facing various stressful factors, such as the conditions of the infant, and changes in the role of parents, the NICU, and the ward staff [2]. In addition, mothers in some NICUs are not allowed to hold, feed, and touch their infants or express their feelings at the beginning or days after hospitalization, which puts them under more pressure, fear, and isolation [3]. Words, such as overwhelming stress, pressure, anxiety, separation, depression, unhappiness, despair, doubt, lack of control over the situation, fluctuation between fear and hope, feeling insecure, shock, and lack of self-confidence were the parents' description of the time when the infant was admitted to the NICU. The parental stress level is especially high during the first week of hospitalization [4]. Stress is a natural response to events that create a sense of threat and imbalance. However, if the stress level is too intense and its duration is too long, it will have physical and mental consequences [5]. Lack of paying attention to this stress affects the infant's health in addition to endangering the mother's health. Many studies have announced that a lack of paying attention to the mother's emotional and psychological stress makes her not have enough attachment to her infants. This issue increases the vulnerability of the child and the mother and even affects the quality of the emotional relationship between them over a long period [6]. Mental health is also a basic human need and is considered vital to improving the quality of life [7, 8]. Cultural differences, subjective evaluations, and various specialized theories affect how to define "mental health" [9]. Mental health is the successful performance of mental functions that lead to the establishment of appropriate relationships with other people and the ability to adapt to changes and deal with problems [7].

Various non-pharmacological interventions are available to reduce the stress of mothers with preterm infants hospitalized in the NICU, including teaching spiritual self-care, art therapy, music therapy, family-centered care, and writing a letter [10]. One of the main purposes of gratitude is to relieve and reduce unpleasant symptoms and its role in creating positive psychological possibilities and experiences and the benefits of analyzing people's inner capacities for healing. Gratitude is a positive quality of human life. Gratitude helps people to feel more comfortable about the situations that made them feel better about themselves, and to manage stressful and difficult situations in their daily lives. Gratitude improves physical and psychological health. Teaching gratitude by increasing the level of happiness is effective in reducing depression as much as increasing positive physical activities [11]. Researchers have reported the role of gratitude meditation in increasing parasympathetic activity and noted that not only deep breathing exercises but also mindfulness and attention to gratitude decreased the heart rate of the participants [12]. Gratitude interventions significantly increased mental, spiritual, and physical well-being because grateful people are more capable than others in terms of forming social commitments, using stress-coping skills, and solving creative problems [13]. Although the number of hospitalized infants in NICU has increased and the parents have many psychological problems, so far no research has been conducted in the field of gratitude intervention on these parents. The present study was conducted to investigate the effect of an educational intervention based on gratitude on the stress and mental health of mothers with infants hospitalized in the NICU.

Methods

The present study was a quasi-experimental controlled clinical trial. The research population included mothers with infants hospitalized in the NICU of Shahrekord City, of whom 50 people were selected and included in the study (Figure 1). The sample size was calculated using the below sample size formula at the alpha level of 0.05 and the test power of 80%, considering at least 10% drop out of 25 people in each group. The selected samples were divided into two intervention and control groups (Equation 1):

1. $$n=\left(\frac{n=Z_{(1-\alpha)}+Z_{(1-\beta)}}{d}\right)^2$$

The inclusion criteria included mothers in the first 24 hours after birth, parents who, according to the mother, have no history of any neurological and psychiatric diseases and are not drug addicts, having an infant hospitalized in the NICU, the absence of anomalies, no previous experience of hospitalization of a newborn in the NICU or the death of a newborn, not being separated from a spouse, being able to read and write Farsi, not being a member of the health and treatment team, and not having a child with a serious illness.

Mothers with the death of a hospitalized baby, or the occurrence of a stressful event at the time of the intervention, such as divorce or job loss, were excluded from the study.

After the approval of the research design, the researcher referred to the management department of medical education centers affiliated with Shahrekord University of Medical Sciences and explained the objectives of the study, and received the necessary permission to continue the study process. Then, 50 mothers with infants hospitalized in the NICU were selected using convenience sampling and provided with the demographic characteristics questionnaire, parental stress questionnaire, and Goldberg and Hiller's general health questionnaire (GHQ-28). An informed consent form was completed for all subjects. Further, after completing the questionnaires, the subjects were equally divided into two intervention (25 people) and control (25 people) groups. The researcher trained the intervention group in three two-hour sessions every week for two weeks. Ward nurses provided routine recommendations for the control group. The educational content was prepared using authentic books and articles and the supervisor and advisor and an expert in the field of psychology approved them. The educational intervention of this study was based on the spiritual health package of the Ministry of Health and Medical Education in subjects, such as self-awareness, God's call, reliance and recourse, patience, forgiveness, and praise and gratitude after confirming the content of the education [14] (Table 1). After each session, educational content in the form of pamphlets was provided to the participating mothers. Two weeks after the intervention, the subjects re-completed the questionnaires.

The demographic questionnaire included the mother and child's information, including age, education level, occupation, place of residence, type of pregnancy, history of infertility, history of admission of other children in the NICU, gender of the child, history of child hospitalization, the reason for hospitalization, and duration of hospitalization.

Parental stress questionnaire: The stress level in the preterm infant's mother was measured using the parental stress questionnaire. This questionnaire was designed by Heydari et al. (2015). It included 26 questions with four areas, nature of stress, parents' reactions, consequences of parents' stress, and stress management. The selected areas were prioritized and reviewed by 12 experts. To measure the stress of a preterm infant's mother, the first 11 questions of the questionnaire were used. This questionnaire has seven-choice questions with Likert scoring, from zero ("I have not experienced at all") to six ("I have completely experienced"). Parent's stress scores were determined as 0-16 (no stress), 16-1.33 (low stress), 33-1.50 (moderate stress), and 1.50 or higher (severe stress) [15].

Goldberg and Hiller's general health questionnaire (GHQ): GHQ was used to measure mental health. Out of the 28 items of the questionnaire, items 1 to 7 were related to the scale of physical symptoms, items 8 to 14 examined anxiety symptoms and sleep disorders, items 15 to 21 were related to the evaluation of social function symptoms, and finally, items 22 to 28 measured depression symptoms [16]. This questionnaire as a screening tool took 10 to 12 minutes to check the mental health status of a person [17]. In this study, a 28-question standardized form was used and the answers were coded on a Likert scale (0-1-2-3). The cut-off point was such that people with a score of 22 and below were classified in the healthy group and people with a score of 23 and

Table 1. Content of the educational intervention

Session	Title of Session	Content of Education
1st	Self-awareness	Communicating with God and listening to the inner voice
2nd	Prayer	The word of God or each higher power that the mother believes in
3rd	Trust and recourse	Trust in God and resort to Him
4th	Patience	History of religious figures
5th	Forgiveness	Communicating with the sacraments, prayer, sacrifice, penance, and charity
6th	Gratitude	Thanks and gratitude

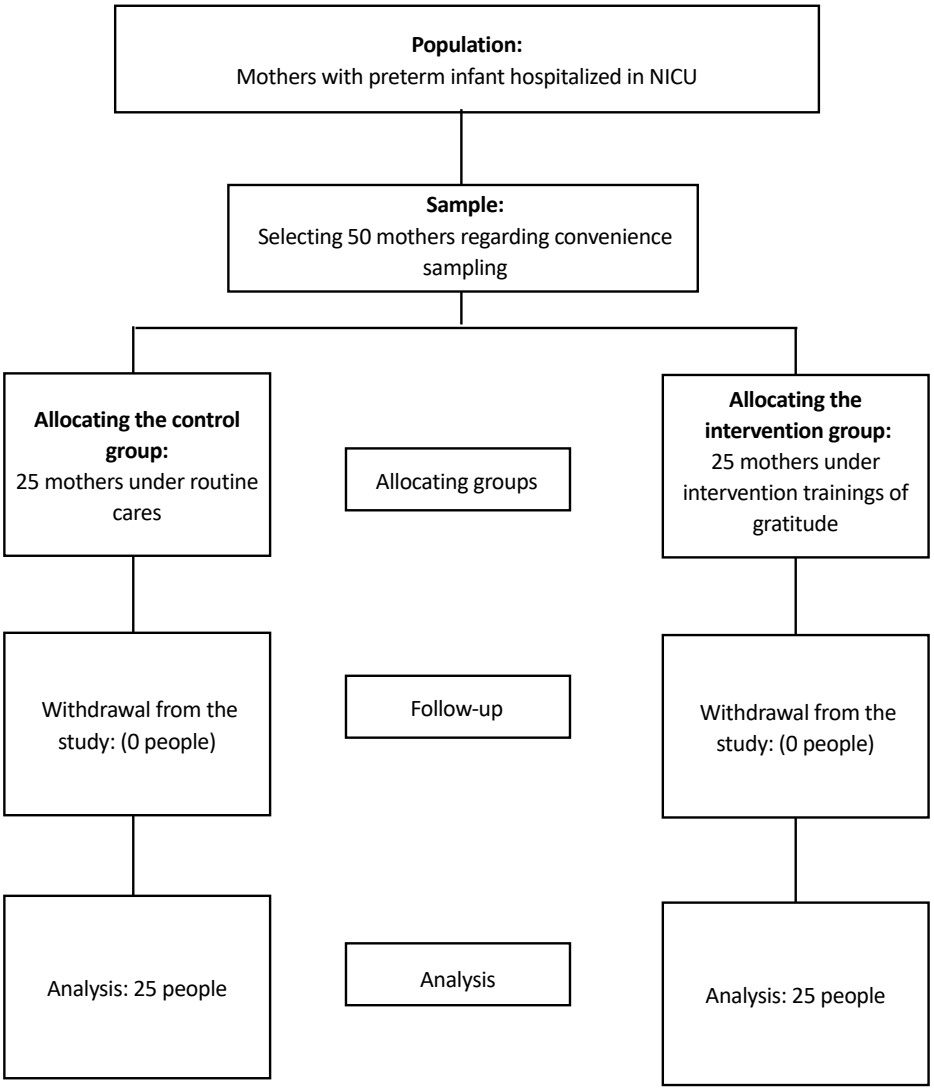

Figure 1. Flowchart of the present study

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above were classified in the group of disordered people [18, 19]. Gibbons et al investigated this questionnaire [20], including its factorial structure, validity, and reliability, and using the test re-test method, the reliability coefficient was 74%. In Iran, Taghavi et al. assessed the psychometric properties of GHQ-28. Re-test, descriptive, and Cronbach's α coefficients were 70%, 93%, and 90%, respectively.

Statistical methods

After collecting the data, the data was entered into the SPSS software version 18. Descriptive data were analyzed in the form of tables and figures (Mean±SD), and analytical data were analyzed using the independent t-test, chi-square test, paired t-test, and Fisher's exact test. The significance level was considered to be 0.05. The values for qualitative variables (percentage) were reported as frequency and for quantitative variables, they were reported as Mean±SD. The Fisher's exact test and chi-square test were used for all qualitative variables, and the independent t-test was used for quantitative variables.

Results

In this study, 50 mothers with preterm infants hospitalized in NICU were examined in two groups of 25 people (intervention and control). The mean age of the studied mothers was 28.84±3.82 years. The oldest mother was 37 years old and the youngest was 24 years old. Table 2 presents the comparison of the demographic characteristics of mother and child in the intervention and control groups. No significant difference was observed in the mothers' age in the two groups. In both groups, most

Table 2. Comparison of demographic characteristics in the studied groups

Groups / Variables		Mean±SD/No. (%)		P
		Intervention	Control	
Age (y)		28.52±3.65	29.16±4.03	0.56
Education	Illiterate	3(12)	2(8)	0.80
	Diploma and lower	13(52)	12(48)	
	Academic	9(36)	11(44)	
Job	Housewife	14(56)	12(48)	0.78
	Employee	6(24)	6(24)	
	Others	5(20)	7(28)	
Child's gender	Female	15(60)	13(52)	0.56
	Male	10(40)	12(48)	
Type of delivery	Cesarean section	19(76)	17(68)	0.52
	Normal	6(24)	8(32)	
Type of pregnancy	Desired	23(92)	20(80)	0.22
	Undesired	2(8)	5(20)	
Rank of birth	1st child	18(72%)	17(68%)	0.94
	2nd child	6(24%)	7(28%)	
	3rd child	1(4%)	1(4%)	

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mothers had a diploma and lower degree and showed no significant difference (P=0.80). In both groups, most mothers were housewives and showed no significant difference (P=0.78). Also, the frequency of cesarean delivery was higher than normal delivery. This difference between the two groups was not significant (P=0.52). Most mothers had previously planned pregnancies and the difference between the two groups was not statistically significant (P=0.22). It was also found that none of the mothers had a history of infertility. The number of female children was more than male children. This difference was not statistically significant (P=0.56). Most mothers in both intervention and control groups had their first child. This difference between the two groups was not statistically significant (P=0.94).

According to Table 3, the independent t-test showed that the mean stress score of the mothers of both groups before and after the intervention was not significantly different (P>0.05). However, after the intervention, the mean stress score in the intervention group was significantly lower than in the control group (P<0.001). Also, the mean changes before and after the intervention in the intervention group were significantly higher than in the control group (P<0.001). The paired t-test to compare the mean stress score of mothers showed that in the intervention group, the mean stress score of mothers decreased significantly compared to pre-intervention (P<0.001), but no significant difference was observed in the control group (P>0.05) (Table 3). The independent t-test showed that the mean score of physical symptoms before and after the intervention in the intervention group was significantly lower than in the control group (P<0.05), but the changes before and after the intervention in the two groups of intervention and control showed no significant difference (P>0.05). The paired t-test showed that the mean score of physical symptoms in each of the intervention and control groups before and after the intervention did not differ significantly (P>0.05) (Table 4). The independent t-test showed that the mean score of anxiety symptoms

Table 3. Comparison of the mean stress score of mothers in the studied groups before and after the intervention

Groups / Time of Intervention	Mean±SD		P
	Intervention (n=25)	Control (n=25)	
Before	37.64±5.04	35.72±5.64	0.211
After	26.36±6.58	34.08±3.78	<0.001
P	<0.001	0.094	
Changes before and after the intervention	11.28±7.81	1.64±4.70	<0.001

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and sleep disorder before and after the intervention in the intervention group was significantly lower than in the control group (P>0.05). The paired t-test showed that the mean score of anxiety symptoms and sleep disorders in the intervention and control groups before and after the intervention did not differ significantly (P>0.05) (Table 4). The independent t-test showed that the mean score of social function in the intervention and control groups in the intervention group was lower than in the control group (P<0.05); however, the changes before and after the intervention in the two intervention and control groups did not show a significant difference (P<0.05).

The paired t-test showed that the mean score of social function in the intervention and control groups after the intervention was significantly lower than before the intervention (P<0.01). The independent t-test showed that the mean score of depression before the intervention was not significantly different in both groups (P>0.05), but after the intervention, the mean score of depression in the intervention group was significantly lower than in the control group (P<0.05). The paired t-test showed no significant difference in the score of depression in the intervention and control groups before and after the intervention (P>0.05) (Table 1-4). The independent t-test showed that the mean total score of mental health before and after the intervention in the intervention group was significantly lower than in the control group (P<0.05), but the mean changes before and after in the two groups were not significantly different (P>0.05). The paired t-test showed that in the intervention and control groups, the mean score of mental health after the intervention was significantly lower than before the intervention (P<0.05) (Table 4).

Discussion

The present study was conducted to investigate the effect of an educational intervention based on gratitude on the stress and mental health of mothers of preterm infants hospitalized in the NICU. According to the results of the study, the mean stress score before the intervention in mothers with preterm infants hospitalized in the NICU was 86.32. The results of the study conducted by Beheshtipour et al. [21] showed that the mean stress score two days after hospitalization of the preterm infant was 94.36. Vafaei Fuladi et al., who investigated the relationship between spiritual health and stress in mothers of infants hospitalized in NICU, stated that more than half of the mothers (56.7%) experienced moderate stress and 25% of them experienced severe stress. A significant correlation was observed between mothers' spiritual health and their stress [22].

Also, the results showed that two weeks after the gratitude-based training, the mean stress score and its scales in mothers significantly decreased. While in mothers of the control group who only received routine training, no significant difference was observed despite stress reduction. This issue showed the positive and effective effect of the educational intervention based on gratitude for the stress of mothers with preterm infants hospitalized in the NICU. In this regard, Sanai et al. believed that spiritual and religious contents, due to many consequences, create a positive attitude toward themselves, the environment, and the future, as a result of which people do not consider themselves vulnerable and feel relaxed in the environment [23]. Reyhani et al. reported that spiritual counseling reduced stress and increased distress tolerance of mothers with preterm infants in the NICU [24].

The results of this study were consistent with the results of the study conducted by Nair et al., who showed that treatment based on spirituality and religion led to improved disease outcomes in patients with depression [25]. Schappin et al. [26] in the Netherlands and Chourasia et al. [27] in India also indicated the effectiveness of education in reducing parental stress. Jabbari et al. showed that listening to the sound of the Quran can re-

Table 4. Comparison of the mean score of mental health scales in the groups before and after the intervention

Groups / Scales of Mental Health	Stage	Mean±SD		P
		Intervention (n=25)	Control (n=25)	
Physical symptoms	Before the intervention	5.00±1.91	6.44±2.93	0.046
	After the intervention	4.04±2.35	6.48±3.00	0.002
	P	0.110	0.941	
	Changes before and after the intervention	0.96±2.89	-0.4±2.68	0.211
Anxiety and sleep disorder	Before the intervention	7.72±2.35	9.28±2.84	0.040
	After the intervention	5.36±2.94	8.16±3.04	0.002
	P	0.08	0.112	
	Changes before and after the intervention	2.36±4.09	1.12±3.40	0.249
Social function	Before the intervention	6.84±2.17	8.76±2.52	0.06
	After the intervention	4.60±2.57	6.60±2.72	0.010
	P	0.002	0.002	
	Changes before and after the intervention	2.24±3.23	2.16±3.16	0.930
Depression symptoms	Before the intervention	6.00±2.31	7.28±2.73	0.080
	After the intervention	5.20±2.22	6.76±2.86	0.036
	P	0.191	0.591	
	Changes before and after the intervention	0.080±2.97	0.52±3.97	0.779
Total score of mental health	Before the intervention	26.56±4.53	31.76±7.28	0.001
	After the intervention	19.20±4.04	28.00±7.31	<0.001
	P	<0.001	0.032	
	Changes before and after the intervention	6.36±5.66	3.76±8.23	0.200

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duce the level of perceived stress and hidden and overt anxiety of pregnant women [28]. Pourdad et al. showed a negative and significant relationship between gratitude and social support and death anxiety in the elderly [29]. Kristiana et al. found that gratitude training is effective in reducing mothers' stress [12]. Algood et al. showed that American mothers with mentally retarded children who reported a high level of religious beliefs experienced less stress and as a result, used more effective coping styles (problem-oriented) to deal with the caregiving problems of their children [30]. Spiritual and religious beliefs increase people's self-confidence and help people find meaning and purpose in life by providing a constructive perspective. Regarding the emotional field, spiritual and religious behaviors reduce negative emotions, such as anxiety and depression by satisfying people's inherent needs for dependence and material connections, and providing people with a sense of security. Regarding the behavioral field, religious behaviors, such as prayer and worship moderate the harmful effects of stress through support networks and promoting health behaviors. Also, spirituality and religious beliefs facilitate coping with problems and stress through understanding the temporary psychological discomfort or life's sufferings. In quasi-experimental research, Bolhari et al. reported that spiritual intervention leads to stress reduction in women with breast cancer [31]. The results of these studies were consistent with the present study,

which can be due to the effect of spiritual care on improving the conditions, tolerance, and resilience of these people in stressful times. These studies were somewhat similar to the present study in terms of the type of intervention. Religious and spiritual commitments seem to protect a person from stress caused by uncontrollable life events, such as death and severe illnesses that can cause distress, anxiety, and depression. Tuck showed that intervention and spiritual care increases the improvement of the quality of life and reduces the response to stress, tension, and depression of people. However, the results of his study showed the limited and little effects of spiritual care and its interventions on people [32]. The more the human ability to control threatening events is greater, the more ability to adapt to stressors will be. Spiritual interventions help people evaluate negative events with a different cognitive approach and a strong sense of control over problems to be formed in them [33].

According to our results, the mean score of mental health of mothers with preterm infants hospitalized in the NICU was 26.56. Also, the results of the present study showed that the educational intervention based on gratitude significantly improved mental health and its scales. However, in the control group that received routine training, the changes in physical and anxiety symptoms and sleep disorders were not statistically significant.

In most psychological research, the effects of religious attitudes and religious orientation on mental health have been emphasized, and many studies have been conducted on the relationship between religion and mental health. In a meta-analysis (2010) conducted on religious studies and mental health, the results showed a positive relationship between religion and mental health in 47% of studies. In 23% of studies, a negative relationship was observed and in 30% of them, no significant relationship was observed [34]. In Iran, studies have shown that religious attitude has a positive effect on mental health. Jajarmi et al. showed that religious attitudes can be effective in increasing women's mental health and resilience [35]. The results of a study in the US showed that to provide family-oriented care to parents in the NICU, it is necessary to determine the dimensions of spirituality in their lives, then based on those dimensions, spiritual care should be provided to improve the quality of care [36]. A study conducted on the behavior of American and Italian mothers showed that some parents tend to re-state their spiritual needs and spiritual beliefs [37]; therefore, the care team in the NICU for holistic care must pay attention to the cultural backgrounds of mothers with hospitalized infants. Gonçalves et al. [38] stated that spiritual and religious interventions had significant effects on general symptoms of anxiety, meditation, and psychotherapy and also reduced depression.

According to the interpretation of the Quran, loss and misery are conditions, where a person loses his/her soul and hope because this issue can affect his faith and religious beliefs. As a result, patients are more vulnerable to religious beliefs than healthy people. For people who have religious feelings and beliefs, more power enters their lives, and when all hopes are lost in the battle of life, religious feelings and beliefs change the gloomy life of the patients [39]. The solution to creating mental health and vitality in society is to pay attention to the religious attitude and strengthen it in the society. Improving the mental health of people is not possible except by strengthening the knowledge of God.

Considering the nature of gratitude, which is thoughtful attention to values, possessions, and positive experiences in daily life, the results showed that gratitude training by increasing the focus on the positive aspects of events and finding meaning among the positive and valuable aspects of life can be effective on reducing stress and improving the health of mothers in the intervention group. Therefore, the effectiveness and efficiency of this educational program are confirmed.

In the present study, the samples were selected from mothers with preterm infants hospitalized in the NICU, and many of them did not show the desire to participate in the study due to the critical conditions they faced. The conditions of the COVID-19 pandemic prevented the holding of group training for more than three people, the mothers in the early days of pregnancy were unable to sit in the center's training classes due to the incision related to cesarean surgery, and the intervention was limited to the rest area and the breastfeeding rooms and educational classes. Due to the lack of two wards of NICU and the possibility of transferring educational written files between the mothers of the control group, random sampling was conducted.

Conclusion

Based on the results obtained from the present study on the participating samples, gratitude has a significant effect on reducing the symptoms of depression and reducing stress and improving the health of mothers with preterm infants. It seems that the present study is the first on the effectiveness of gratitude in the health of Iranian mothers with preterm infants hospitalized in the NICU. Gratitude and the belief that gratitude will increase grat-

itude influence a critical part of Iranian women's religious beliefs and are a crucial factor in the effectiveness of mind and body interventions. This study was conducted in the Iranian Muslim community and showed that spirituality and especially gratitude are vital in the mental health of mothers with infants hospitalized in the NICU. Therefore, it is necessary for the care team, especially the nurses, to use spirituality, especially gratitude, as a solution to manage the stress of mothers with infants hospitalized in the NICU. It is also recommended that hospital managers take necessary measures by holding training workshops for nurses about the importance of spirituality and gratitude to educate patients and their companions.

Ethical Considerations

Compliance with ethical guidelines

This research was reviewed and approved by the Ethics Committee of Shahrekord University of Medical Sciences (Code: IR.SKUMS.REC.1400.223). An informed consent form was completed for mothers who wanted to participate in the study. The information collected from them remains confidential to the researcher. Mothers were allowed to withdraw from the study at any time if they did not wish to continue participating in the study. To participate in the study, all costs were paid by the researcher and no costs were imposed on the subjects. Sending the study results was possible for the mothers who wanted to receive the study results.

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Authors' contributions

All authors contribute to the conception, design of the work, and the acquisition, analysis, and interpretation of data. Also, they developed drafting the work and revising it critically for important intellectual content. They agree for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of interest

The authors declared no conflict of interest.

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