



Original Article

Exploring the effects of self-reflection practice on cognitive emotion regulation and resilience among mothers of premature neonates

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ABSTRACT

Background & Aim: Despite the well-known benefits of practicing self-reflection in educational settings, little is known regarding the effects of applying it in clinical settings. The objective of the current study was to investigate the effects of self-reflective practice on cognitive emotion regulation and resilience of mothers of preterm infants in the NICU.

Methods & Materials: A total of 90 mothers whose preterm infants were admitted to NICU enrolled in the current non-randomized clinical trial study by convenience sampling (n=45 in each group). The data of the control group were gathered prior to the intervention group. Pre- and post-test data were gathered using the demographic questionnaire, the Cognitive Emotion Regulation Questionnaire, and the Conner and Davidson Resilience Scale. Self-reflection practice was designed and conducted based on Gibbs' reflective cycle for the intervention group, which applied a blended model (face-to-face and virtual). Statistical analysis was conducted by SPSS-25 and using the repeated measure ANOVA.

Results: Using ANCOVA, the results indicated that the self-reflection practice was effective in improving cognitive emotion regulation ($F=66.01, P\leq 0.001, \eta^2=0.60$) and resilience ($F=89.43, P\leq 0.001, \eta^2=0.67$) among mothers in the intervention group.

Conclusion: Self-reflection practice was an effective intervention for improving mothers' skills, helping them be more resilient, and assisting them in regulating their emotions. Further studies should support the current study findings in different clinical settings.

Introduction

The birth of a premature newborn and later admitted to the Neonatal Intensive Care Unit (NICU) is the most vital supply of stress for mothers (1). Role change, catastrophizing (2), unfamiliarity with complexities of technology (3), communication and infant-parent attachment disorders, fear of losing the newborn, and uncertainty about the future are the common sources of stress for mothers. Also,

the mothers of preterm neonates experience stigma, guilt, fault, and self-blame (4, 5).

They may experience social isolation and a lack of support from their spouse (3). As a result, the mothers whose premature newborns are admitted to the NICUs are vulnerable to suffering from behavioral and emotional problems and emotional distress concerning maladaptive emotion regulation.



Studies have indicated that emotion regulation, a technique that alters emotional and cognitive processes, effectively reduces the symptoms of stress, depression, and anxiety(6). Emotion regulation involves all the conscious and unconscious strategies individuals use to increase, maintain, or decrease their emotional responses (7). Cognitive emotion regulation indicates the conscious thoughts by means of which individuals regulate their emotions in response to arousing information(8).

Effective use of cognitive emotion regulation strategies is crucial for mothers who are giving birth to a premature newborn. Studies show that through cognitive emotion regulation, stress management has a positive effect on improving the newborn-parent attachment and the newborns' developmental outcomes(9). On the other hand, cognitive emotion regulation reduces anxiety and promotes resilience skills.

Resilience is considered a continuum with different degrees of adaptation or success under the influence of individual capacities and social factors (10). An individual's resilience capacity is correlated with their emotion regulatory capacities and has the potential to be a moderator between the stressors and their immediate psychological outcomes (11). What has been recently highlighted by the growing body of literature is that exposure to stressors or traumatic events can increase the individual's resilience to future stressors. These findings imply that engaging with the stressors may lead to healthy emotional development and resilience strengthening by triggering self-reflection (12).

Reflective ability is identified as one of the core concepts of resilience and is correlated with emotion regulation (13). Studies also have revealed that reflective practice is one of the most adaptive methods of cognitive emotion regulation.

Self-Reflection is closely related to the concept of rethinking and is a systematic metacognitive process in which a deep understanding of experience is achieved through one's internal inquiry (14). Reflection focuses more on an individual's

experience and involves those intellectual and affective activities applicable for exploring the experiences and leading to a new understanding. Although there are different definitions of self-reflection in the existing literature, most of them focus on purposeful critical analysis of knowledge and experiences (15). It has been proposed that self-reflective processes can refine individual emotional regulatory experiences and develop resilience capacities by increasing self-awareness, self-evaluation, and self-driven adjustment (12). But, while some existing literature emphasizes the important role of self-reflection in developing resilience (11), other studies have revealed that some factors, including self-insight, are more influential in developing the capacity for resilience (16). Furthermore, the findings of a more recent study indicated that self-reflection activities do not necessarily improve an individual's capacity to refine their emotion regulation; instead, those involved in self-reflective practice may demonstrate higher anxiety symptoms (17).

It is expected that the mothers who have premature neonates are able to develop their capabilities of becoming more resilient and self-emotionally regulated due to their exposure to the different stressors they encounter. Accordingly, nurses need to apply fostering resilience programs approved in terms of effectiveness and feasibility in each context. Given that resilience is a context-dependent concept, and considering the previous controversial findings regarding self-reflective activities (17) the current study has been conducted to explore the effects of self-reflection practice on cognitive emotion regulation and resilience in mothers of premature neonates in NICUs.

Methods

Study design and participants

The current study used two groups, a non-randomized clinical trial design. A total of 90 mothers (n=45 for each intervention and control group) whose

premature infants were admitted to NICU in a hospital affiliated with the Tehran University of Medical Sciences were recruited for the study if they fulfilled the inclusion criteria (Figure 1). Accordingly, the sample included mothers who had a premature infant aged 28 to 35 weeks without any anomaly and, those whose neonates were hospitalized in NICU for at least 15 days, mothers who were willing to participate and could use social media apps such as WhatsApp or Telegram. Based on their declaration, people diagnosed with a

psychological illness and those treated with psychological medications at the time of the study were excluded from the study. Additionally, people who had another hospitalized infant or child at the time of the study or had a history of hospitalization in the neonatal intensive care unit and those who had experienced the death of at least one of their children were excluded. The mothers were excluded from the study if their neonates had died/were discharged before 15 days or missed at least three face-to-face or online training program sessions.

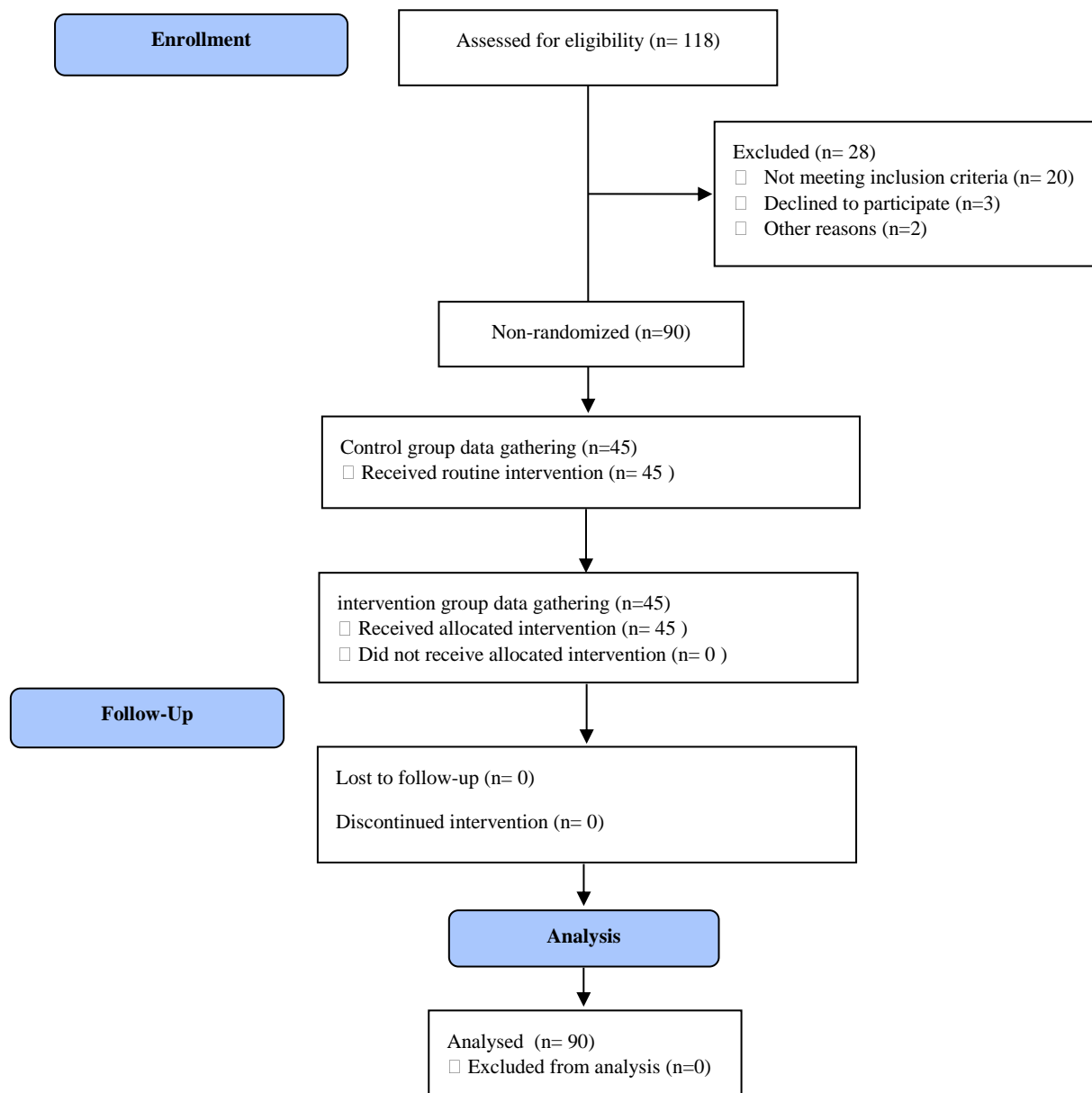


Figure 1. CONSORT Diagram of the study

Sampling and data collection

The calculation of study samples was made based on an alpha error of 0.05 and a power of 80% with an effect size of 0.8. Considering the probable attrition rate of 10%, a total of 90 mothers were recruited in the current study.

The convenience sampling method included the mothers of preterm neonates in this study. The control group's data was gathered prior to the intervention group to manage data contamination. The study's main researcher initially identified participants through the admit list records of the hospital. Once the participants had consented, the study objectives and procedure were described, and the contact information of the main researcher was provided so they could respond to any questions the participants might have. The participants signed the written consent forms and were then enrolled in the study. While the control group participants received routine nursing care in NICU (no organized training for mother, absence of any psychological consultation, and other supportive programs) they were asked to fill out the questionnaire form during the first 24 hours after their neonates' admission in the NICU. The research team members decided to collect the baseline data (Pre-test) in each group after 24 hours of neonates' admission to ensure the mothers had enough time to provide their answers to the questionnaire. The post-test data were gathered for the control group at the 15th day of neonate admission at the NICU. One week after the last neonate of the control group was discharged from NICU, the main researcher conducted a similar procedure for the intervention group's participant's recruitment. All meetings with mothers were held in the NICU mothers' room individually. Pre-test data was gathered, and each mother in the intervention group enrolled in three face-to-face sessions followed by online self-reflection training sessions. Similar to the control group, the post-test data were gathered at the 15th day of neonate admission at the NICU in the

intervention group. The data were gathered from July 2019 to February 2020.

The intervention; self-reflection practice

A team of experts, including three NICU nurses, one neonatologist, two research coordinators, one NICU head nurse, and one psychologist, developed the intervention. Sessions composed of a total of ten hours were carried out for two months before starting data gathering. Gibbs' reflective cycle was applied to adapt the current study intervention. Graham Gibbs developed the Reflective Cycle in 1988. By using this reflective cycle, we can give structure to learning from our own experiences. The cycle consists of six stages. At first, participants are asked to describe their experiences (stage 1) and express their feelings and thoughts regarding their experiences (stage 2). They need to evaluate their experiences (stage 3) and analyze them to grasp meanings (stage 4). In the next step, they are supposed to conclude what they have learned and indicate what changes to their actions are beneficial for improving future outcomes. Finally, they should provide an action plan for similar situations that may happen in the future (stage 6) (18). The intervention consists of three face-to-face educational sessions followed by virtual interactions between each mother and the main researchers on the base of the WhatsApp platform. The main objective of conducting the three sessions was to introduce and make the mothers familiar with the Gibbs' reflective cycle. To ensure the mothers are eligible for using this practice, the intervention was continued virtually. When each mother was available to participate, the first three sessions (1 session per day) were carried out in the NICU. Using discussion and spending time for practice, the main researchers (F.K.F& F.K) focused on the introduction, descriptions of the Gibbs' reflective cycle and its applications in daily life, exploring how each stage works, and presented examples during the first three sessions. The duration of each session was 30- 45 minutes. Some assignments were

provided by the research team members, and each mother were asked to send her reflection assignments to a WhatsApp group that the mother and the main researchers were the participants of it and was created for this purpose. According to their pace of learning, each mother was trained individually. The practices, the online training on the assignments, and providing feedback on the

assignments provided by the principal researchers (F.K.F& F.K& J.M) as well as a psychologist. It continued until the fifteenth day of the neonate's admission. No one was excluded from the study in the intervention group. The summary of the intervention topics is presented as an additional file (Table 1).

Table 1. The intervention summary

Gibbs' reflective cycle stages	Description	Example questions	Assignments
Stage 1: Description	This stage aims to describe the situation in detail. There's no need to express feelings or conclusions at this stage.	Describe what has been happened? When and in which place did it happen? Describe who was involved in this situation and what they did? What turned into the final results of the situation?	At this stage, the participant was asked to explain what happened and their current situation. A sample assignment: Participant No. 10, the mother of a 28-week-old baby boy admitted to the NICU ward, described her condition as follows: <i>"When I entered the ward today, I saw that there were two nurses above my baby. At first, I thought something bad had happened to him; then I saw that they wanted to cut his hair to have a catheter. My son Ahura was crying a lot and limping."</i>
Stage 2: Feeling	This stage is designed to investigate the feelings or thoughts that you had experienced during the situation. Also, there's need to discover how your feelings or thought affects your experiences.	Describe your feelings/ thoughts during the situation. Are there any differences between your feelings/ thoughts before and after the situation happened? What about other people's feelings or thoughts? Are there any changes happened in their feeling /thoughts before and after the situation?	The participant was then asked to express their feelings at this stage according to the current situation Participant No. 10 at this stage wrote: <i>"The discomforts are not over; I am very upset. Today, when I saw my son in that device, I was very upset. I do not know what to do. I feel very helpless and depressed; I always try to comfort myself, but I still do not calm down. Today, when I saw my son's hair is shaved, it was as if he was setting me on fire. My whole body trembled. I asked God for my death. Wow, how painful it must be; oh my God, these days are over; let me go back to my happy days. Nothing is more important to me than Ahura's health I just think that my God is merciful and these days are over."</i>
Stage 3: Evaluation	This stage aims to evaluate the actions that have been provided in response to the situation. Using self-reflection, the participants are asked to focus on both positive and negative aspects of the situation.	Please describe both the positive and negative aspects of your experience. What action/feeling/thought went well? Explore what didn't go so well. Please explore the positive and negative aspects of your/others' actions during the situation.	The participant was then asked to state what she thought were the good and bad aspects of the situation. Participant No. 10: <i>"Honestly, I thought a lot about the good aspects of this story. Well, the nurses had my baby's hair cut so that they could inject and help him to be saved, and all this is for the sake of my baby's health. But the bad aspect is that my child is at this young age, and with this low weight, how much pain should he suffer? What is his guilt? Is my child being punished "</i>
Stage 4: Analysis	This stage aims to provide the opportunity of grasping the meanings of what happened. It will be possible by focusing on why it is happened instead of what happened.	Explain why did some actions didn't work/work? Explain what you have understood from the situation.	At this point, the participant was asked to state what lesson she had learned from the situation, and she replied that: <i>"I became a mother, and I am supposed to witness many good and bad days in my son's life while I am with my child, so I have to think less emotionally and be a little more patient and think more logically, and none of God's works are foolish".</i>

Stage 5: Conclusion	In this stage, the participants are asked to conclude about what happened during the situation. They need to summarize their learning and highlight what changes in their actions can improve the outcomes.	What have you learned from the situation? What skills do you need to acquire to handle a situation like this better? what else should you have done differently?	In the fifth step, the participant was asked to say what she thought she could have done in that situation, and she wrote that: " <i>Now that I think about it, I wish that instead of crying so much in the ward, I would go and caress my son so that he would feel less pain; maybe things would be much better</i> ".
Stage 6: Action Plan	This stage aims to help individuals to plan for acting efficiently in the future similar situations.	What will you do if you be in the same situation? Please describe how you may develop the required skills and competencies that are needed for better acting in similar future situations? How do you make sure that you are capable of acting differently in the future?	In the end, the participant was asked to state what she would do if she was in this situation again, and the participant stated that: " <i>This time, I will definitely think more logically, and instead of upsetting everyone, I will go and support my son and help him calm down so that the nurses can do their job more easily</i> ".

Measures

We have used three instruments in the current study: the demographic questionnaire, the Cognitive Emotion Regulation Questionnaire (8), and the Connor and Davidson resilience scale (19). The mothers were asked to report their basic demographic characteristics, such as age, marital status, employment status, current economic condition, and education level, assessing the demographic characteristics.

Cognitive Emotion Regulation Questionnaire (CERQ)

The CERQ is a 36-item multidimensional scale that aims to measure the cognitive aspects of emotion regulation. A multidimensional scale measures nine cognitive strategies for emotion regulation that individuals use after experiencing a situation. Using a five-point Likert scale ranging from 1 (almost never) to 5 (almost always), the CERQ is a suitable scale for applying in both general population and clinical settings. The scores of each subscale range from 4 to 20, and higher scores indicate greater use of the strategy (8). The Persian version of the questionnaire includes 36 items, and nine scales (Self-blame, Other-blame, Rumination, Catastrophizing, Positive refocusing, Planning, Positive reappraisal, putting into perspective, and acceptance) were used in the current study. The Cronbach's alpha subscale ranges were from 0.64 to 0.82

in the previous study (20). To ensure the validity of the content, the Persian version of CERQ was assessed both qualitatively and quantitatively. For qualitative assessment, the questionnaire was provided to 10 experts in the field of health and psychology to obtain their feedback and comments on the accuracy of the wording, item allocation, and representative of the items. In terms of quantitative assessment, this study utilized a content validity ratio (CVR) to make sure the instrument was fully assessed or measured the construct of interest. To compute CVR and modified kappa coefficient (K), this study asked the 10 experts mentioned above to rate the essentiality of the CERQ items using: Not essential, Useful but not essential, and Essential(21). Then, based on the formula of $(ne - (N/2)) / (N/2)$, the CVR was calculated ("ne" is the number of experts who rate the items as "Essential", N is the total number of the experts). The CVR of the CERQ in the current study was calculated as 0.75.

The Connor and Davidson resilience scale (CD-RISC)

CD-RISC is a 25- items multidimensional scale that has been developed to measure individual resilience. This scale uses a five-point Likert scale ranging from 0 to 4 to score the responses. Hence, its scores could range from 0 to 100, with higher scores representing more resiliency. This scale has been validated in several groups, such as the general population, individuals who were

referred to the primary care unit, and patients with generalized anxiety disorder and post-traumatic stress disorder. It also showed suitable psychometric properties(19). Cronbach's alpha coefficient of the Persian version of the scale was reported to be 0.89(22). Also, its test-retest and Cronbach's alpha coefficients were 0.92 and 0.96, respectively(23). In this study, the Cronbach's alpha coefficient of the questionnaire was 0.85. Furthermore, the CVR was calculated as 0.78.

Data analysis

At first descriptive statistics were carried out. The normal distribution of the data was evaluated by Shapiro–Wilk test. The data were analyzed using MANCOVA and ANCOVA. Inferential statistical analyses were undertaken using SPSS25. All tests were two-tailed, and a p-value of <0.05 was considered to be statistically significant.

Ethical consideration

The Ethics Committee of Tehran University of Medical Sciences approved the Ethical Considerations of this study (Reference No.: IR.TUMS.FNM.REC.1397.083). In addition, all participants were informed of the purpose of the data collection, and questionnaires were distributed to the respondents only after they provided their consent to participate in the survey. Moreover, the respondents were ensured that their participation was voluntary and confidentiality of all collected data was guaranteed.

The Iranian Registry has approved the current study of Clinical Trials (IRCT); the IRCT20180925041132N1.

Results

The Characteristics profile of the study participants is presented in table 2. The two groups were similar based on age, education, marital status, family type, and economic status.

Table 2. The characteristic profile of the respondents and assessing groups' homogeneity

Variables	Control group	Intervention group	Test
Age	Mean (SD) 29.17(5.55)	Mean (SD) 29.66 (5.39)	t= -42.0 P= 0.65
Educational level	N(%)	N(%)	$\chi^2= 3.46$ p= 0.32
Diploma & lower Upper diploma	37(82.2%) 8(17.8%)	33(73.7%) 12(26.7%)	
Marriage status	N(%)	N(%)	$\chi^2 = 0.45$ p= 0.5
Living with spouse Divorce	39(86.7%) 6(13.3%)	41(91.1%) 4(8.9%)	
Family type	N(%)	N(%)	$\chi^2 = 0.44$ p= 0.5
Nuclear family Extended family	28(62.2%) 17(37.8%)	31(68.9%) 14(31.1%)	
Economic status	N(%)	N(%)	$\chi^2 = 8.13$ p= 0.43
The family income is NOT enough for living expenses The family income is NOT enough for living expenses	44(97.8%) 1(2.2%)	38(84.4%) 7(15.5%)	

Regarding comparing the variable mean scores, table 3 shows the mean scores of cognitive emotion regulation and resilience from two groups based on both pre-and post-tests. Univariate Analysis of Covariance (ANCOVA) and Multivariate Analysis of Covariance (MANCOVA) were used to compare the mean scores from the

control and interventional groups for pre- and post-tests.

ETA coefficient indicated that 60% and 67% of the difference in cognitive emotion regulation and resilience post-test scores were due to self-reflective intervention in the intervention group.

Table 3. comparing the mean (SD) of cognitive emotion regulation and resilience from two groups based on both pre-and post-tests

Variables	Control group		Intervention group		ANCOVA test results	MANCOVA test result
	Pre-test	Post-test	Pre-test	Post-test		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Cognitive emotion regulation	120.04(18.5)	126(13.26)	115.57(17.10)	154.02(10.62)	F=66.01 P=0.001 Eta=0.60	F=100.01 P=0.001
Resilience	61.77(15.45)	58.8(15.79)	57.53(10.95)	79.91(8.04)	F=89.43 P=0.001 Eta= 0.67	Eta=0.70

Discussion

This study was designed to investigate the effects of self-reflective practice on cognitive emotion regulation and resilience of mothers whose neonates have been admitted to the NICU. To the best of our knowledge, this is the first study that has been conducted in the field as mentioned earlier. Using ANCOVA and MANCOVA tests, the current study revealed that self-reflective practice has good potential for improving resilience and cognitive emotion regulation. The Eta coefficient indicated that more than 60% of the dependent variables’ variance changes were rooted in the intervention.

This study suggests that adding self-reflective practice to the routine care in NICU is associated with improving cognitive emotion regulation and resilience in the target group. Furthermore, although the intervention duration was only 15 days, the current study showed that these positive effects on the mother could occur in a relatively short period following program implementation. Further research should attempt to investigate how self-reflective practice improves the two dependent variables of the current study and how long the effects last.

The existing knowledge suggests cultural sensitivity to self-reflection and its functions regarding emotion regulation. It is indicated that the socio-cognitive and affective processes undertaken by individuals from different cultures, for example, Easterners and Westerners, are different, and Easterners may experience greater distress after self-reflecting on negative personal experiences (24). The current study findings

are supported by previous studies that indicate that private self-reflection can be considered the antecedent of emotion regulation (24). Further studies need to be conducted in order to investigate the self-reflective intervention among mothers of preterm neonates in different settings.

The findings of a meta-analysis conducted by Naragon-Gainey et al. (2017), which examined the underlying structure of common emotion regulation strategies, indicated that tolerance to stress is associated with some factors include lower levels of repetitive negative thinking, experiential avoidance, higher levels of acceptance, self-appraisal, and mindfulness (25). The aforementioned finding suggests that the association between emotion regulation and resilience is due to self-reflection. The findings of a study conducted by Falon et al. (2021) revealed that self-reflection resilience-strengthening training enhances maintaining stable mental health during experiencing stressor events (17). As such, this evidence supports the current study findings regarding the efficacy of self-reflective practice on the resilience of mothers during exposure to the stress of neonate admission to NICU.

Previous studies have indicated the positive effects of self-reflection on fostering resilience in different populations, including teachers (26), new perioperative nurses(27), and patients with chronic diseases(28), but little is known regarding the current study population. It has been found that encouraging parents to engage in self-reflective practice can help them contribute to

their child's psychological health via situation acceptance (29). Furthermore, increased self-awareness and greater self-regulation can be achieved through self-reflection, contributing to resilience improvement. Self-reflection can also enhance attachment between parents and children. Studies have pointed to a quite substantial effect of resilience on attachment between neonates and parents (30).

Study limitations

This study has multiple limitations. First, it was only conducted in 15 days, and no follow-up data were gathered. Second, although the study setting was a referral NICU center and the current study participants may represent different socio-cultural classes in Iran, there is a need to conduct further studies in different study settings to improve the study findings' generalizability. Third, the nature of the quantitative design of the study leads to a lack of knowledge regarding how the mothers' resilience and cognitive emotion regulation improved. Further studies with mixed-method approaches are suggested to answer the questions as mentioned above.

Conclusion

Mothers whose preterm neonates are admitted to NICU suffer from different stressors. As a result, they need interventions to improve their acceptance and improve their emotion regulation and resilience skills. According to Gibbs' reflective cycle, the current study findings indicate that self-reflective practice can contribute to improving a mother's emotion regulation and resilience. The findings of this current study are applicable to developing resilience fostering interventions and are also useful for nursing intervention in NICU.

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Conflicts of interest

The authors declare that there is no conflict of interest in this study.

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