

The Effect of Problem Solving Skills Training on Moral Distress of Neonatal Intensive Care Unit Nurses

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Abstract: Introduction: Moral distress is one of the ethical challenges in the nursing profession. Nurses in the neonatal ward are at risk of moral distress most commonly results from disproportionate interventions perceived to not be in the child’s best interests. The aim of this study was to determine the effect of problem-solving skills training on the moral distress of neonatal intensive care unit nurses. **Methods:** This quasi-experimental study performed on 70 nurses working in neonatal intensive care units at Pediatric Medical Center affiliated Tehran University of Medical Sciences from December 2019-June 2020. They were assigned randomly in two equal groups. Corley Ethical Distress Scale Corley was completed before and four weeks after the intervention in two groups. Problem-solving skills training was conducted in (6 sessions of 1.5 hours (2 sessions per week) as a group for the intervention group. Data were analyzed using the software SPSS 22 and tests, chi-square, Fisher's exact, t-test, and paired t-test with significance. %0.5 . **Results:** The results of comparing the moral distress of nurses working in the neonatal intensive care unit showed that before the intervention, the score of moral distress in the intervention group (150.07 ± 6.87) and in the control group (146.05±6.36) Although before the intervention, the moral distress score of the nurses in the test group was significantly higher than the intervention group P=0.013, but 4 months after the intervention, this score decreased significantly (P <0 01). **Conclusion:** According to the findings of this study, problem-solving skills improve moral distress in nurses. Therefore, due to the destructive effects of moral distress on the quality of nurses' work, it is suggested that nursing managers develop programs to improve problem solving skills in nurses.

Keywords: Problem Solving Skills Training, Moral Distress, Neonatal Intensive Care Unit, Nurse.

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INTRODUCTION

Each moral foundation has a distinct set of associated concerns, vices, and virtues (Wheeler *et al.*, 2019) Moral distress -the feelings that follow when a person's values are compromise (Mendes, 2017) is one the main problems in the neonatal intensive care (Guttmann *et al.*, 2021). Factors that contribute to moral distress among health care providers in acute care settings include the complex ethical climate, the highly technological nature of intensive care that creates fear of providing burdensome treatments, conflicting personal moral judgments among members. (Morley *et al.*, 2021) The relationship between the general level of moral distress and the quality of newborn care, integration and coherence of the service delivery process, burnout and

nurses' retirement has been confirmed in previous studies. (Atashzadeh-Shoorideh *et al.*, 2021, Maranga and Abunga, 2021, Dacar *et al.*, 2019, Barr, 2020) Therefore, measures that can reduce the experience of moral distress in the neonatal intensive care unit can help professionals to provide optimal conditions for nurses' professional performance. (Bong, 2019) Studies conducted in Iran also indicate the existence of different degrees of moral distress in nurses in different wards. (YektaKooshali *et al.*, 2018) especially neonatal intensive care units. (Tajalli *et al.*, 2021, Saleh *et al.*, 2019, YektaKooshali *et al.*, 2018).

The nature of caring for sick infants with uncertain treatment outcome and the need for difficult

decisions in the workplace, leads to an increase in the prevalence of moral distress in this ward. (Prentice *et al.*, 2018, Barr, 2020, Mills and Cortezzo, 2020) The effects of moral distress include Physical and psychological symptoms, decline in job satisfaction and inappropriate nursing care. (Jones-Bonofiglio, 2020, Scascighini *et al.*, 2021) Moral distress can affect nurses' job position and increase the tendency to leave the profession (Laurs *et al.*, 2020, Naboureh *et al.*, 2020)

Although research into the field of moral distress in nurses has grown significantly over the past few decades, there are still various aspects of this issue that require further research (Mills and Cortezzo, 2020, Morley *et al.*, 2021).

There is general agreement that the negative effects of moral distress are both personally and professionally problematic, as they cause health care professionals to lose emotional connection with individuals and families (Larson *et al.*, 2017) (Karakachian and Colbert, 2019) There is also evidence that moral distress can be related to other important concepts such as burnout. (Fumis *et al.*, 2017) But there is still not enough evidence about the effective method in reducing moral distress, and the need for more research in this field has been expressed by experts. (Zeydi *et al.*, 2022, Deschenes *et al.*, 2021)

Problem-solving interventions have been approved as a cognitive-behavioral therapy (Shaffer *et al.*, 2018). Because Problem Solving therapy (PST) is an effective treatment for a wide variety of populations and clinical problems, it can be considered a transdiagnostic approach because it taps into commonalities across populations. (Nezu *et al.*, 2019) Conceptually, since stress plays an important role, either as a causative variable and a maintaining variable in many forms of psychopathology and patient problems, its transdiagnostic nature seems reasonable. (Krause *et al.*, 2021)

To illustrate the wide range of applications, note that PST is effective for the following patient populations and psychological and medical problems: depressive symptoms in post-partum women; (Tezel and Gözümlü, 2006, Mohammad and Gholami Heidarabadi, 2019) family caregiver education (Houts *et al.*, 1996) although interventions to reduce moral distress: a systematic review of the literature. Educational interventions offer a promising direction, but researchers explain more research is needed (Morley *et al.*, 2021). However, no study was found to investigate the effect of this method on the moral distress of neonatal intensive care nurses. Therefore, the present study was designed and conducted to determine the effect of problem solving skills training on moral distress of neonatal intensive care unit nurses.

METHODS

This quasi-experimental study performed on 70 nurses working in neonatal intensive care units at Pediatric Medical Center affiliated Tehran University of Medical Sciences. For Ethical Consideration the ethics license was obtained from the Bioethics Committee of (...) University of Medical Sciences. The list of all nurses working in neonatal intensive care units was prepared from the nursing office. Random allocation was done based on the table of random numbers.

To determine the required sample size with α (probability of error of the first type) 0.05 and (probability of error of the second type) $\beta = 0.2$ and assuming that the effect of problem solving skills on moral distress of nurses working in neonatal intensive care units is at least $d = 15$ score In the formula, the mean difference between the two groups was considered.

Inclusion criteria include: bachelor's degree in nursing, No treatment with antidepressants anti-anxiety drugs and have no history of anxiety disorders based on self-report, at least 6 months of work experience in the neonatal intensive care unit, obtaining a minimum score of 96 from the Moral Distress Questionnaire (1-96 low severity of moral distress). People who did not have moral distress according to the questionnaire were not included in the study. Exclusion criteria were refusal to attend training sessions twice or more.

Data Collection Tools

The following tools were used for data collection in the current research:

1. Demographic details: This form contained the demographic data of the NICU nurses, including age, clinical experience, history of NICU work, work shifts (morning, evening, night, rotational), education level, marital status, and completed courses regarding problem solving.
2. Corley Moral distress Scale. (Corley *et al.*, 2001) this tool is designed by Corley *et al.*, (2001) to measure nurses' moral distress, and includes 30 items in the 7-point Likert scale that have been standardized for Iranian nurses by the Motevallian *et al.*, (2008). In each item, this tool has the options of most of the day, every day, most days, some days, once in a while, almost never and never, respectively, with 1,2,3,4,5,6,7 The score is determined, so that the number 1 indicates the least moral distress and the number 7 indicates the most moral distress. The overall score of the tool is 30-210. The overall score of moral distress was obtained from the total scores of the items.

In order to determine validity and reliability of the questionnaire, the mentioned tool has been used in Iranian studies for the nursing community and it has been found to be valid and reliable. The reliability coefficient

reported for this tool in the mentioned studies was 0.93-0.88%. (Mardani Hamooleh *et al.*, 2016) in this study, the tool was completed by 15 nurses with the same characteristics as the research community, and it was completed again two weeks later by the same people, then the Pearson correlation coefficient for conducting the test twice was 0.85.

Educational Content

The design of problem solving training sessions is as follows:

The first session: general orientation (the ability to recognize the problem - accepting the problem as a potentially changeable natural phenomenon - believing in the effectiveness of the problem-solving framework in dealing with the problem - high self-efficacy expectations in order to implement the steps of the model - the habit of stopping, thinking and then trying to solve a problem). The second session: defining and formulating the problem (gathering all the available information - separating the facts from the hypotheses that need research - analyzing the problem - specifying the real goals). The third session: generation of alternative solutions (determining a range of possible solutions - the possibility of choosing the most effective answer among the answers). Fourth session: decision-making (predicting the possible consequences of each action-paying attention to the usefulness of these consequences). The fifth session: implementation of the solution (execution of the selected method). The sixth session: review (observation of the results of implementation-evaluation)

Intervention

After coordination with the ward officials, 6 sessions of 1.30 hours (2 sessions per week) of problem solving skills training were conducted in six groups of 5-7 people for the intervention group. The training of all groups was done by the main researcher (H. A), and according to the schedule and suggested by the nurses, so as to create minimal interference between the work shift and the training schedule. The entire training period lasted 6 months from December 2019 to June 2020. In this study, in order to teach problem solving skills, group discussion and question and answer methods and activities in small groups were performed using the codified and comprehensive protocol of D'Zurilla and Goldfried. The training venue of the meeting hall was a specialized pediatric hospital with 4 neonatal intensive care units. In this method, nurses were placed in real problem situations using their own previous experiences

in the field of work and personal life, based on the learned principles of problem solving. (Table 1)

Then, 4 weeks after the end of the training, the Corley Moral Distress Questionnaire was completed by the intervention group. Then, the score obtained in the test before and after the intervention was calculated. It should be noted that the content of the sessions and scenarios related to the approval of the group professors who had experience in implementing the problem solving model and two of the psychiatric nursing professors had written in the field of moral distress.

Data analysis performed, in the descriptive statistics. Partial eta-Squared was used to evaluate the effect of the intervention. In inferential statistics, Chi-square, Fisher's exact, independent t-test and paired t-test were used and the analysis was performed using SPSS16 software.

Finding

Seventy nurses in neonatal intensive care units were allocated in two groups of 35 people. The majority of them were 57 women (82.8%) and had 59 bachelor's degrees (84.2%) Table2. Summarizes the demographic variables examined. Chi-square test comparing the demographic variables of nurses in the two groups showed that the groups were homogeneous. Table 3. compares between group and within groups the mean scores of moral distress before and after the intervention in the two groups. The results showed moral distress scores in control group nurses were initially lower than the intervention. The results of analysis of covariance showed that after the intervention there was a statistically significant difference between the scores of nurses' moral distress in the intervention and control groups ($P < 0.001$). The mean adjusted score (95% confidence interval) in the intervention group (147.57, 145.71) 146.64) and in the control group (150/36, 148/50) 439/149 were obtained and after adjustment, the moral distress scores of the intervention group were significantly lower than the control group, which indicates a decrease in the level of moral distress in the control group. The results showed that the changes in the nurses' moral distress scores after the intervention were statistically significant ($P < 0.001$).

Partial eta-Squared was used to check the effect size of the intervention. Based on Cohen's classification, the effect size of 0.01 is considered small, 0.06 medium, and 0.14 high. The effect size of the intervention on nurses' moral distress was equal to 0.20, which shows that the effect of the intervention on this variable is high.

Table 1

Scheduling of training sessions	Educational materials for the intervention group
General orientation	-1Definition of moral distress in nurses - causes of distress and ways to reduce moral distress. 2- Completing the moral distress questionnaire (Corley 2002). -3ability to recognize the problem. - 4- Accepting the problem as a potentially changeable natural phenomenon. 5- Believing in the effectiveness of the problem solving framework in dealing with the problem. - 6 expectations of high self-efficacy in order to implement the steps of the model. 7- The habit of stopping, thinking and then trying to solve a problem.
Definition and formulation of the problem	-1The steps of the problem solving process and determining the problem and gathering all the available information. 2- Separation of facts from hypotheses that require research. 3- Analyzing the problem and transforming it into simpler components. - 4- Determining the real goals.
Generation of alternative solutions	-1Teaching logical decision making steps. 2- Evaluating solutions and prioritizing them. 3- The possibility of choosing the most effective answer from among the answers and implementing the problem solving method step by step.
to decide	-1Predicting the possible consequences of each action and the factors preventing problem solving. - 2 Paying attention to the usefulness of these consequences and evaluating solutions and prioritizing them
Implementation of the solution	-1Execute the selected method. - 2 Viewing the results of the implementation. 3- Practicing problem solving methods in real problems and presenting different solutions
review	-1Evaluating the impact of education in changing thoughts and feelings and solving personal problems and prioritizing tasks at the patient's bedside

Table 2: Demographic variables of nurses in neonatal intensive care unit in the two groups of intervention and control and their homogeneity test

The variables	Intervention N (%)	Control N (%)	Homogeneity test of two groups
Gender			
Female	31 (88.6)	27 (77.1)	
Man	4 (11.4)	8 (22.9)	
Marital status			
Single	13 (37.1)	19 (54.3)	
Married	22 (62.9)	16 (45.7)	
education			
Bachelors	31 (88.6)	28 (80)	
Masters	4 (11.4)	7 (20)	
work experience (years)			
Less than 5	8 (22.9)	14 (40)	t=-1.58 df= 68 P = 0.11
9- 5	7 (20)	7 (20)	
14- 10	6 (17.1)	4 (11.4)	
15 and up	14 (40)	10 (28.6)	
Mean±Sd	11.49±6.84	8.83±7.17	
work experience in NICU (years)			
Less than 5	14(40)	20(57.1)	t=-1.05 df= 68 P = 0.29
9- 5	8 (22.9)	6(17.1)	
14- 10	13(37.1)	8(22.9)	
15 and up	0 (0)	1(2.9)	
Mean±Sd	6.97±4.27	5.83±4.74	
Age (years)			
<30	11(31.4)	13(37.1)	t=-0. df=68 P = 0.92
30-49	16(45.7)	13(37.1)	
>40	8 (22.9)	9(25.7)	
Mean±SD	46.6± 51.34	65.7± 34.34	

Table 3: Comparison within and between groups of the mean score of moral distress in nurses in neonatal care unit

group	Before		After		Test
	Average	Standard deviation	Average	Standard deviation	
Intervention	150.07	6.76	148.46	6.76	t = 4.26 df =34 P < 0.001
Control	146.05	6.36	147.62	6.31	t = 2.92 df = 34 P= 0.006
Test	t =2.54 df = 68 P = 0.013		F = 12/17 P <0.001 $\eta^2=0.2$		

DISCUSSION

This study was conducted to investigate the application of problem solving in reducing the moral distress of nurses in neonatal intensive care units. The results of the pre-test showed high moral distress in the nurses of NICU in both intervention and control groups, which confirmed the previous studies in this field.(Thorne *et al.*, 2018, Mills and Cortezzo, 2021, Barr, 2020, Prentice *et al.*, 2021, Mills and Cortezzo, 2020), and showed the necessity of intervention for these people.

Evaluation and comparison of the score of moral distress obtained before and after the implementation of the problem solving skills program in the intervention group and also comparison between groups after the intervention showed the effectiveness of problem solving skills training on the moral distress of nurses ($P < 0.001$). According to Cohen's classification of effect size, the value of 0.01 is considered small, medium 0.06 and 0.14 high. The effect size of the intervention in nurses' moral distress was equal to 0.20, which indicates the high effect of the intervention in this variable. A review of the study found no direct study of the effectiveness of problem-solving skills on moral distress, and the present study could be the basis for future research. The results of this study were compared with the findings of studies that used other educational interventions to reduce moral distress or problem-solving skills to reduce distress and stress in general.

In general, the findings of this study are in line with the results of Zeraatkar and Moradi ,(Zeraatkar and Moradi, 2019) Heidari and Shahbazi , which show the effect of social problem-solving model of D-zurilla & gold fried on different levels of aggression, decision making, social tolerance and social problem solving.(Heidari and Shahbazi, 2012) Hasan and Tumah also found problem-solving skills to be effective in managing stress in nurses.(Hasan and Tumah, 2019)

In line with the present study, Abbasi *et al.*, (2019) investigated the effect of the empowerment program on nurses' moral distress, the results of this

study show the effect of the program.(Abbasi *et al.*, 2019).

Explaining the effectiveness of this method in relieving nurses' moral distress, it can be stated that unresolved conflicts can lead to negative emotions when people cannot control their emotions properly. Emotional skills, including the ability to recognize and express emotions, can be effective in preventing moral distress and increasing their tolerance for distress. Problem-solving skills may reduce moral distress in nurses by affecting assertiveness skills(Seyedfatemi *et al.*, 2014)

Intra-group comparison of moral distress scores in the control group shows that after four weeks without taking any special action and in the routine state of moral distress in this group has increased $P = 0.006$. It seems not only did the passage of time not lead to the adjustment of these people, but also their situation was deteriorating. This issue shows the need for special attention to this problem in nurses of neonatal intensive care unit.

The present study confirms the results of the 2013 study by Molazem *et al.*, who performed cardiac care units. In the above study, moral distress increased over time in the control group where no intervention was performed.(Molazem *et al.*, 2013)

Because moral distress can have a significant impact on providers, patients, their families, and resulting care management programs, it is imperative that providers go beyond recognizing moral distress and develop effective ways to address it (Chehab, 2017).

In line with the present study, many suggested strategies have been presented to support the recognition and handling of moral distress. These suggestions include workshops, briefings, ethics training, and practices.(Amos and Epstein, 2022) It seems that the common point of these methods and Problem solving skill training is knowing the emotional impact of situations and reflection.

Limitation

The present study, like other studies, had some limitations; among other things, the participants' moods were out of the researcher's control when filling out the questionnaire, which could affect the results of the research. Indeed suggested that interviews and qualitative methods.

CONCLUSION

The results of this study support the results of previous studies that found a positive effect of problem solving intervention on reduce of moral distress. The promotion of problem solving skills in nurses should be the goal of educational interventions, especially in neonatal intensive care units

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Authors' contribution

H.A: conducting educational sessions, data gathering,
Sh.H: statistical analysis

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