



# The effect of Teach-back Method during discharge on the stress and anxiety of mothers of babies undergoing open heart surgery

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## Abstract

**Background and aims:** The research investigated the effect of care training during discharge on the stress and anxiety levels of mothers whose babies are undergoing open heart surgery.

Parents of children with CHD experience high levels of stress and anxiety starting from the time of diagnosis, throughout the hospitalization for cardiac surgery, and even in the months and years that follow.

**Methods:** In this quasi-experimental study, 60 mothers of children undergoing open heart surgery referred to the Tehran Children's Medical Center Hospital entered the study through lottery sampling in 2019. Then, the Teach-back Method program was implemented for the intervention group in four sessions. Data were collected before and immediately after the intervention using a Questionnaire measuring parents' stress and the Spielberger anxiety questionnaire. It was then analyzed using SPSS software version 16.

**Results:** The study found that following the intervention, there was a significant decrease in the average scores of states and trait anxiety compared to the initial scores ( $P=0.006$  and  $P=0.007$ , respectively). Additionally, the average stress score after the intervention was significantly lower than the initial score ( $P=0.001$ ).

**Conclusion:** The findings of this study suggest that offering oral instructions to mothers during the discharge phase of their children's open-heart surgery can lead to positive outcomes by reducing post-operative anxiety and stress. These results highlight the need for further research to explore the long-term effects of post-operative oral education in various clinical settings.

**Keywords:** Teach-back method, Anxiety, Stress, Open heart surgery, Neonate

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## Introduction

Congenital heart disease (CHD) is recognized as the most prevalent form of congenital disability (1). CHD affects approximately 8 out of every 1000 live births worldwide (2). The prevalence of this condition in Iran is estimated to be around 10 000 newborns annually, with approximately eight out of every 1000 births being affected by CHDs (3). Shortly after birth, infants with critical health conditions resulting from CHD often require surgery or interventional treatment as early as the first year of life (4). However, thanks to the success of modern treatment options, approximately 95% of these children now reach adulthood (5).

Mothers and fathers of children born with CHD experience significant stress and anxiety that starts at the time of diagnosis and persists throughout the child's hospitalization for cardiac surgery and the subsequent months and years of follow-up (6). Throughout the anesthesia and surgery process, parents frequently experience feelings of anxiety regarding the general

safety of their child, potential anesthesia-related side effects and risks, worries about pain management, and uncertainty surrounding the surgical outcomes (7). State anxiety in parents may result in bodily and psychological manifestations, which may affect the parent's ability to function normally and is a concern not only for the family but also for the health professionals caring for the child (8).

Research has indicated that parents of children with CHD encounter higher levels of stress in comparison to parents of other pediatric populations, mainly when the child is less than one year old (9,10). The stress experienced by parents has wide-ranging and significant effects. Even minor disruptions in a mother's behavior can negatively impact the infant. The hospitalization of an infant in a heart ward is a highly stressful factor for parents, particularly when urgent care is required. This stress further worsens the situation and harms the family and the effectiveness of interventions (11,12). The stress experienced by parents can also have an impact on their

physical and mental health, overall well-being, and quality of life (13).

While there have been limited investigations on interventions to decrease parental stress and anxiety in pediatric intensive care unit (PICU) settings, these studies have primarily focused on children undergoing treatment for diverse medical and surgical conditions (14,15). There is a scarcity of research specifically examining the effectiveness of educational programs for parents of children with CHD during their hospitalization for heart surgery. However, previous studies have demonstrated that educational interventions led by nurses have proven to be successful in reducing parental anxiety during the recovery period for pediatric patients (16,17), in intensive care unit settings (18), for children with diabetes (19), and children scheduled for elective surgery (20). To date, there has been a lack of research investigating the efficacy of educational programs designed for parents of children with CHD during their hospitalization for heart surgery. Research on nurse-led educational interventions could provide valuable insights into how to support parents of children scheduled for heart surgery and help children cope with the procedure (21).

Hence, the purpose of this study conducted in 2019 was to investigate the effects of using the Teach-back Method during discharge on reducing the stress and anxiety levels of mothers whose babies are undergoing open heart surgery.

## Materials and Methods

The present research was semi-experimental before and after a single group. The study population comprised biological mothers with infants who had congenital heart abnormalities. Who were referred to the Tehran Children's Medical Center Hospital, underwent open heart surgery, and were admitted to the neonatal intensive care unit.

The research sample consisted of 60 mothers of children undergoing open heart surgery who met the study entry criteria and entered the study by lottery. The criteria for entering the study include mothers of children under one year who were diagnosed with congenital heart defects and underwent heart surgery, primiparous mothers, willingness to participate in the study, and Exclusion criteria from the study include infant death during pregnancy study, and mothers' reluctance to continue participating in the study.

After obtaining written permission from the officials of the research unit, the researcher visited the neonatal intensive care unit in the morning shift. He took samples after explaining the research objectives and obtaining written and oral informed consent. All the people were assured that their answers would remain confidential to the researcher, and they could withdraw from the study at any time if they wished.

After receiving the necessary explanations regarding the research objectives and completing the informed

consent form and pre-test questionnaires, the researcher will receive the study samples by the re-education method from admission to discharge on the child's bed in the morning shifts. They did this for education; the educational booklet, oral education, pictures, question and answer, and practical exercises with support were used. According to Table 1, the mothers were trained in four sessions, each 45-60 minutes, according to the mothers' understanding. Parents' understanding of the lessons given was measured by asking them to repeat the content.

The educational materials were repeated and reviewed in case of incomplete understanding or mistakes. This process continued until they fully understood the material. Questionnaires were also completed at the time of discharge.

In the present study, three tools were used to collect the required data: the demographic characteristics questionnaire, the parental stress questionnaire in the neonatal intensive care unit, and the Spielberger state and trait anxiety questionnaire (22). The demographic questionnaire included the mother's age, level of education, and job and employment status of the mother.

A questionnaire measuring parents' stress in neonatal intensive care unit: a 45-question instrument of parental stress in the intensive care unit by Miles et al in 1882 in 4 dimensions: sounds and sights of the ward's environment (5 items), child's appearance (19 items), child-parent communication (10 items), personnel communication and behavior (11 items) and a general stress item were designed. Grading is on a Likert scale (0=no experience of the mentioned items, 1=no stress at all, 2=very little stress, 3=moderate stress, 4=high stress, 5=extreme stress). The range of scores is from 0-230; A higher score indicates more stress.

The content and face validity of the questionnaire were checked and confirmed by ten professors of pediatric nursing and special care and ten mothers of infants with congenital heart defects undergoing open heart surgery. The reliability of the questionnaire was also checked and confirmed by the internal consistency method and Cronbach's alpha calculation ( $\alpha=0.83$ ).

The Spielberger State-Trait Anxiety Inventory is a questionnaire consisting of forty items that evaluate both state anxiety (twenty items) and trait anxiety (twenty items). Each item is assigned a score ranging from 1 ("Almost never") to 4 ("Almost always"). Consequently, the overall scores for state and trait anxiety can range from 20 to 80, with higher scores indicating greater levels of anxiety (22). The STAI is a widely accepted and dependable tool for measuring anxiety, known for its validity and reliability (23,24).

After data collection, data analysis was performed using SPSS software (version 16.0). Initially, the normality of the data was assessed using the Kolmogorov-Smirnov test. Subsequently, paired-sample t-tests were utilized to compare each group's mean scores of the STAI and Stress

**Table 1.** Educational content for mothers with infants undergoing open heart surgery referring to children's medical hospital

Number of sessions	Educational content
First	Causes and symptoms of the disease, how to perform open heart surgery, pre-surgery care, training in the use of drugs (for example, digoxin)
second	Movement restrictions - nutrition and diet
third	Wound care (dressing change, suture removal, and bathing) - prevention of bacterial endocarditis
fourth	Cardiologist follow-up visits - when to call specialists: signs and symptoms related to post-operative complications

Questionnaire. The significance level in all statistical analyses was set at less than 0.05.

## Results

The study's findings showed that 50% of the babies were boys, and the rest were girls. 46.7% had wall defects, 38.3% had obstructive disorders, and the rest had other heart disorders. Most mothers (78.3%) were 20-40 years old. 45% of the mothers were homemakers, and the rest were employed. Most mothers (66.7%) had a literate (Table 2).

The paired *t* test showed that the average score of state and trait anxiety after the intervention was significantly lower than at the beginning of the study. A paired *t*-test was used to compare the difference in the anxiety score before and after the intervention. The difference between state and trait anxiety scores before and after the intervention was significant ( $P=0.006$  and  $P=0.007$ , respectively).

The paired *t*-test showed that the average stress score after the intervention was significantly lower than at the beginning of the study. A paired *t*-test was used to compare the difference in the stress score before and after the intervention. The difference between the stress score before and after the intervention was significant ( $P=0.001$ ; Table 3).

## Discussion

This study aimed to determine the effect of care training during discharge on the stress and anxiety of mothers of babies undergoing open heart surgery.

The result of this study showed that before the intervention, mothers of children undergoing open heart surgery experienced a considerable level of stress and anxiety.

Multiple studies have examined the impact of using teach-back methods in chronic patients, including those with cardiovascular diseases, which indicate a positive effect of using this educational method (25,26). In confirmation of this finding, a study involving 96 mothers of children undergoing open-heart surgery in Tehran revealed that these mothers encountered elevated levels of anxiety prior to the intervention (27). Consistent with this finding, Menahem et al found that mothers of children undergoing open-heart surgery experience significant stress and emotional distress (28). One potential justification could be the impact of having a child with a severe cardiac condition, an unforeseen event beyond their control, and perceived as having an uncertain outcome, particularly before the surgery.

**Table 2.** Participants' demographic and clinical characteristics

Characteristics	GI N (n=60)	
Gender	Boy	30 (26)
	Girl	30 (26)
Educational status	Illiterate	20(34.3)
	Literate	40(66.7)
Employment status	Employed	33(55)
	Housewife	27(45)
	Wall defects	19(46.7)
Type of disorder	Obstructive disorders	32(38.3)
	Other disorders	9 (15)
Age	20-40	47 (78.3)
	40 and more	13 (21.7)

**Table 3.** Comparison of the intervention group regarding the mean scores of state and trait anxiety and stress

Group		Intervention (n=60) Mean ± SD	Mean difference	<i>t</i>	<i>P value</i> *
State anxiety	Before	53.40 ± 2.98	1.45	2.825	0.006
	After	51.95 ± 2.94			
Trait anxiety	Before	52.05 ± 3.15	5.57	2.236	0.007
	After	46.48 ± 2.06			
Stress	Before	222.92 ± 5.14	72.97	67.851	0.001
	After	149.95 ± 7.77			

\* The paired-sample *t* test.

Multiple studies have also confirmed this finding (29,30). The literature establishes a direct correlation between the anxiety and stress levels experienced by parents and the stress levels observed in their children (31,32).

The findings of this study showed that immediately after the intervention, mothers of children undergoing open-heart surgery experience low levels of stress and anxiety. The findings of an intervention study on parents of children undergoing open-heart surgery demonstrated that providing verbal education and counseling to parents leads to a significant reduction in both state and trait parental anxiety and stress (33). The findings of a quasi-experimental study in Tehran showed that conducting two sessions of verbal education for mothers of children undergoing open-heart surgery resulted in a significant reduction in maternal anxiety (27).

The findings of this study align with previous research investigating the effects of oral instructions. These studies have demonstrated that providing pre-operative

instructional courses can decrease anxiety levels and enhance adaptability. For instance, a study in Italy discovered that offering pre-operative information through oral instructions and visual aids of ICU appliances significantly reduced parental anxiety compared to standard ward preparation (21). The structured delivery of information in oral instruction sessions has been found to enhance knowledge and skills and positively reduce anxiety and stress.

A prior study involving three different groups demonstrated that using oral instructions combined with written tools and images plays a critical role in diminishing pre-operative anxiety experienced by parents (34). In contrast to the results of the present study, a quasi-experimental study involving 300 randomly selected mothers revealed that while providing oral information may alleviate children's concerns prior to general surgeries, it may not be as effective in reducing parental pre-operative anxiety (35). This discrepancy in results could be attributed to factors such as the type of pediatric surgery, the different instruction tools, and the intervention's timing.

In another study, parents were shown an 8-minute video illustrating the process of hospital admission and anesthesia induction. This intervention effectively reduced anxiety levels and alleviated the need for additional information among the parents (36). Additionally, a study examining the effects of an orientation tour on state and trait anxiety in candidates for coronary artery bypass surgery reported a decrease in pre-operative anxiety levels (37). Providing information and education through audiovisual aids or information leaflets helps understand the hospital process and reduces anxiety and stress among mothers. This study, conducted in children undergoing surgery for CHD, is the first of its kind. The stress and anxiety experienced by their parents differ from other surgeries due to the increased morbidity and mortality associated with CHD. Parental anxiety is not limited to the perioperative period and may persist even after hospital discharge. Information, education, and counseling for parents have a positive impact on reducing stress and anxiety and improving mood.

The limitations of this study include the self-reported nature of the questionnaires used and the limited number of studies on nursing care education during the discharge phase, particularly in Iran. It is also important to note that the findings of this study may not be generalized to all mothers of children undergoing surgery. However, using valid scales to assess anxiety and stress is the strength of this study.

## Conclusion

Conveying oral instructions and demonstrating images to mothers of children undergoing open-heart surgery can effectively decrease post-operative stress and state and trait anxiety. This study indicates that providing

oral instructions to mothers during the discharge phase of their children's open-heart surgery can have positive outcomes in reducing post-operative anxiety and stress. These findings contribute to the existing knowledge and emphasize the distinct effects of post-operative oral education on state and trait anxiety and stress in mothers of children who are candidates for surgery. Future research should also consider examining physiological indicators of anxiety and stress. Based on these results, further investigation is necessary to explore the long-term effects of post-operative oral education in different clinical settings.

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## Authors' Contribution

**Conceptualization:** Maryam Jangjoo.

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**Formal analysis:** Firouzeh Moeini.

**Funding acquisition:** Firouzeh Moeini.

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## Competing Interests

The authors declare that there is no conflict of interest.

## Ethical Approval

This study was done based on the Declaration of Helsinki. The Ethics Committee of Azad University of Medical Sciences, Tehran, Iran (approval code: IR.TMU.REC.1402.048) obtained the necessary permissions and approvals. Before group allocation, written informed consent was obtained from all participants.

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