The effect of education on anxiety and self-efficacy in mothers of 1-3-year-old children under cochlear implant surgery, 2018: a randomized controlled clinical trial

El efecto de la educación sobre la ansiedad y la autoeficacia en madres de niños de 1 a 3 años de edad con cirugía de implante coclear, 2018: un ensayo clínico aleatorizado y controlado

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Abstract

Introduction: Child's surgery makes parents' anxiety and concern. Therefore, the present study was conducted to evaluate anxiety and self-efficacy of the mothers of the children undergoing cochlear implant surgery.

Methods: This randomized trial was performed on 70 mothers of children who had undergone cochlear implant surgery in Khalili Hospital in Shiraz from December 2017 to March 2018. The samples were randomly assigned to intervention (35) and control (35) groups. Four training sessions were held for the intervention group. The data were gathered by Spielberger and Sherer's questionnaires and analyzed through SPSS version 21, using Chi-square test, Fisher's exact, Independent t- test and repeated measurements ($p < 0.05$).

Results: Before the intervention, the mean score of hidden and apparent anxiety and self-efficacy in the intervention group were 46.48±7.93, 47.40±8.73 and 61.40±9.86 .In the control group, it was 46.25±8.89, 46.77±9.63 and 59.42±10.42 and no differences were seen between two groups variables ($p < 0.05$). Immediately after the intervention the results showed a significant decrease in variables ($P < 0.001$). Two months later variables in the intervention group were 25.42±3.22, 26.80±3.70 and 82.14±2.41 ($P < 0.001$). In the control group, they were 46.60±8.79, 47.25±9.87 and 58.68±9.95 ($P<0.001$). Moreover, a significant difference was shown between the two groups in the mean of apparent ($F=277.40$, $P < 0.001$) and hidden anxiety ($F=285.96$, $P < 0.001$) and also in the mean of self-efficacy of the mothers ($F=170.17$, $P < 0.001$) during the three study periods.

Conclusion: Educational interventions in the mothers of the children undergoing cochlear implant surgery were effective in reducing the amount of anxiety and increasing their self-efficacy.

Trial Registration Number: IRCT201708072432N5.

Keywords: Education, Cochlear implantation, Anxiety, Self-efficacy

Resumen

Introducción: la cirugía infantil hace que los padres se sientan ansiosos y preocupados. Por lo tanto, el presente estudio se realizó para evaluar la ansiedad y la autoeficacia de las madres de los niños sometidos a cirugía de implante coclear.

Métodos: este ensayo aleatorio se realizó en 70 madres de niños que se habían sometido a una cirugía de implante coclear en el Hospital Khalili en Shiraz desde diciembre de 2017 hasta marzo de 2018. Las muestras se asignaron al azar a los grupos de intervención (35) y control (35). Se realizaron cuatro sesiones de entrenamiento para el grupo de intervención. Los datos se recopilaron mediante los cuestionarios de Spielberger y Sherer y se analizaron mediante SPSS versión 21, utilizando la prueba de Chi cuadrado, la prueba de Fisher exacta, la prueba t independiente y las mediciones repetidas ($p < 0.05$).

Resultados: antes de la intervención, la puntuación media de la ansiedad oculta y aparente y la autoeficacia en el grupo de intervención fue de 46.48±7.93, 47.40±8.73 y 61.40±9.86. En el grupo control, fue de 46.25±8.89,

46.77±9.63 y 59.42±10.42 y no se observaron diferencias entre las variables de dos grupos (p<0.05). Inmediatamente después de la intervención, los resultados mostraron una disminución significativa en las variables (P <0,001). Dos meses después, las variables en el grupo de intervención fueron 25.42 ± 3.22, 26.80 ± 3.70 y 82.14 ± 2.41 (P <0.001). En el grupo control, fueron 46,60 ± 8,79, 47,25 ± 9,87 y 58,68 ± 9,95 (p<0,001). Por otra parte, se mostró una diferencia significativa entre los dos grupos en la media de ansiedad aparente (F=277.40, P<0.001) y oculta (F=285.96, P<0.001) y también en la media de autoeficacia de las madres (F=170.17, P <0.001) durante los tres períodos de estudio.

Conclusión: las intervenciones educativas en las madres de los niños sometidos a cirugía de implante coclear fueron eficaces para reducir la ansiedad y aumentar su autoeficacia.

Número de registro de prueba: IRCT201708072432N5.

Palabras clave: Educación, Implantación coclear, Ansiedad, Autoeficacia.

Introduction

Children born congenitally deaf as well as those who become deaf before the age of three cannot learn the verbal language and interact with the audio world. This lack of language acquisition during the early years of life affects the child's ability to communicate, his declaration and expression of emotions. As a result, this lack of language acquisition for deaf people leads to a great crisis in establishing their interpersonal relationships[1]. Diagnosing the child's deafness and taking necessary medical and auditory measures within the sensitive age of language learning can have a positive effect on linguistic skills, thereby improving emotional capabilities, self-discipline, self-control and increasing social skills of the deaf children[2]. Therefore, if hearing loss in newborns is not treated, some complications such as delay in speech language and communication skills may happen[3]. Using cochlear implantation in people with high hearing loss can improve the hearing ability and improve their quality of life[4]. Cochlear implant is the only treatment that can restore some hearing to a deaf person by inducing electrical stimulation in the nerve[5]. Cochlear implant is done for about 80,000 children worldwide, as well as in some countries, for most children with severe hearing loss[5]. Despite the fact that cochlear implantation is increasingly available for deeply deaf children in many countries, parents still need to get the necessary information about this method and its possible outcomes so that they can make decisions consciously[6]. Also, surgery is an anxious experience for the patient and his family in general and in any way that is performed: selective or emergency, small or big, diagnosis or therapy and invasive or non-invasive. Because it can be considered as a threat to the patient's life; that is often caused by fear of unknowns and potential changes in the patient's lifestyle[7]. Considering the fact that this preoperative anxiety and anesthesia not only engages the child, but also his parents and patients depend on their families to provide support during the illness and also they can receive anxiety and tension from their parents, we have to pay attention to families in addition to patients[8]. In fact, in the case of illness and the need for a child's surgery, parents must be compromised by a disorder in their lifestyle. Including the fear and anxiety that may be involved in the welfare of the child[9]. Parental anxiety is associated with a variety of factors on which some studies have focused; they include the child's age, history of the child's previous surgery, history of the other children's surgery, information about the operation and its subsequent care[10,11].

Another problem with the parents of children in need of surgery is their low self-efficacy. Albert Bandura (1997)[12] Reference?, a social cognitive theorist, defined self-efficacy as a person's belief and judgment of his ability to perform a particular task. Self-efficacy is a cognitive structure that is effective in controlling and organizing an individual's behaviors. In the case of parents, self-efficacy is an important cognitive structure in relation to parental performance[13]. Parental self-efficacy is referred to as the parents' assessment of their ability to play parental roles[14]. In many studies also showed that increasing knowledge can increase self-efficacy[15] Nurses, as important members of the health team, should be able to understand the emotional and psychological responses of the parents and can create a good educational environment related to that disease and its outcomes for the parents so that the parents can better adapt to the created condition and get a better understanding from their new role in that new position[16].

Due to the special importance of the subject matter and the issues raised in this regard and considering the fact that limited information is available on the effect of educational interventions on the anxiety and self-efficacy of the mothers of 1-3 year old children admitted in the surgical departments, this study was conducted aiming to determine the effect of educational program on the anxiety and self-efficacy of mothers of the children who had undergone cochlear implantation.

Materials and methods

The present randomized clinical trial study was conducted on mothers of 1-3 year old children who had selected from polyclinic and they had undergone cochlear implant surgery and hospitalized in children's ear surgery department of Khalili Hospital in Shiraz from December 22nd, 2017 to March 20th, 2018.

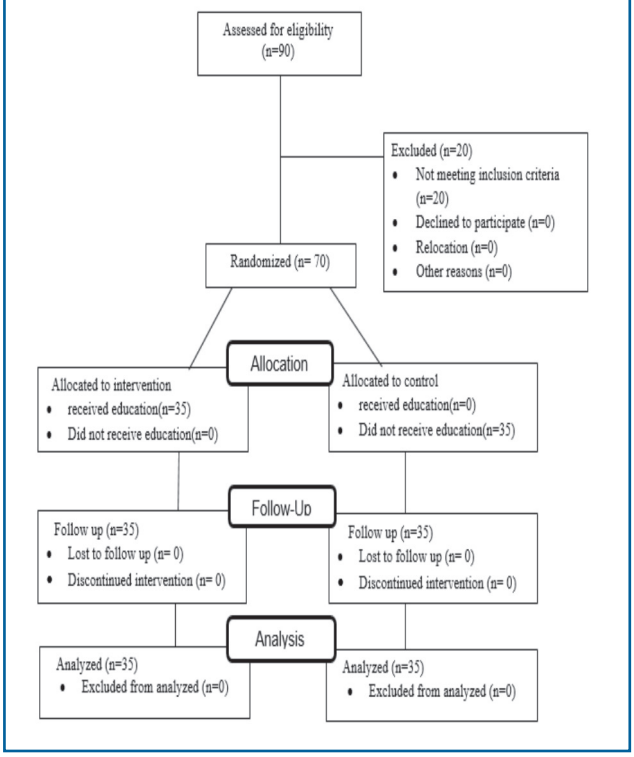
Based on a study performed by Edraki et al. in 2014[17], the values were considered as d =4.7, δ_d =7.5, α =0.05 and β

=0.2. Considering dropout rate of 25%, the sample size was estimated 70 people (35 persons for each Group)

$$n_1 = n_2 = \frac{\left(z_{1-\frac{a}{2}} + z_{1-\beta}\right)^2 \times \delta_d^2}{d^2} = \frac{(1.96 + 1.28)^2 \times 7.5^2}{4.7^2} = 27$$

The inclusion criteria to this study were having no history of hospitalization of the child, patients with bilateral sensorineural hearing loss, being the first child, being at the age of 1-3 years old, mothers having no psychological problems, and mothers not participating in the training sessions about this problem of the child. The exclusion criterion of the study was the mother's reluctance to continue cooperation and participation in the study. The participants of two groups were blinded to random allocation and Participants have no information about random allocation. 70 mothers who had the inclusion criteria were entered in the study. Then, they were placed in one of the control or intervention groups with random assignment using RA software, block random allocation with the block size of 4 and there were 18 four blocks samples, after that 70 persons were selected and they were investigated and tracked within two months from the time of admission until the next visit to the ear clinic. None of the samples were excluded from the study until the end of the study. (Figure 1) shows the information of the mothers participating in this study.

Figure 1: CONSORT flow diagram of the participants



The data collection tools included: demographic information check list, Spielberger State-Trait Inventory, and Generalized Self Efficacy (GSE) questionnaire. The demographic information check list included questions about the mother such as age, level of education, occupational status, family income level and history of sedative intake, as well as information about the child, including age, sex, and number of hospitalizations. To determine the content validity, we gave the questionnaire to five faculty members and necessary revisions were made based on their opinions and it was approved by them.

Spielberger State-Trait Inventory questionnaire is used to measure apparent and hidden anxiety, It contains 40 questions and consists of two dimensions of apparent anxiety and hidden anxiety, each of which having 20 questions. Obvious anxiety scale evaluates an individual's emotions at the moment and at the time of responding[17]. Apparent anxiety is determined by a four degree Likert scale (very low, low, high, very high) and each of the options is given a score of 1 to 4, respectively. The hidden anxiety scale measures ordinary feelings of people most of the time[17]. Hidden anxiety is determined by a four degree Likert scale (almost never, sometimes, most often, and almost always) and score of 1 to 4, respectively. In this test, the obtainable anxiety score is between 20 and 80. The following (Table 1) describes the categorization of each group of anxiety according to the total score of the questionnaires[18].

Table 1. Categorization of anxiety scores

Categorization of anxiety	Apparent Anxiety	Hidden anxiety
Mild	21-30	20-31
Medium to Low	32-42	32-42
Medium to High	43-53	43-52
Fairly Intense	54-64	53-62
Intense	65-75	63-72
Very Intense	76-80	73 upwards
Total Scores	20-80	20-80

*Spielberger, et al[18], 1970. Where is *

Validity and reliability of Spielberger State-Trait Inventory questionnaire have been studied and proved in many researches. Spielberger et al. reported internal consistency coefficients for the scale have ranged from .86 to .95; test-retest reliability coefficients have ranged from .65 to .75 over a 2-month interval[18].

In Mahram's study in the Iranian society in1993, the reliability level for the norm group (600 persons) in the apparent and hidden anxiety scale, based on Cronbach's alpha, was 0.91 and 0.90, respectively, and in the criteria group (130 persons) it was equal to 0.94. For evaluation of construct validity, a concurrent criterion method was used. The comparison of anxiety mean of the norm and criteria societies in all age groups and at two levels of 0.05 and 0.01 showed a significant difference, indicating the validity of the test in measurement of anxiety[19].

Sherer's Generalized Self Efficacy Scale (GSE), which was designed by Scherer et al. in 1982, is used to measure self-efficacy and includes 23 items. 17 out of 23 items are devoted to public self-sufficiency, and the 6 others are related to self-efficacy experiences in social situations[19]. In this study, a self-efficacy 17-item scale was used; it con-

sists of 17 questions with 5 options, from I totally agree to I totally disagree. The lowest score is 17 and the highest 85. Scherer et al. (1982) reported Cronbach's alpha 86% for this questionnaire[20].

In a research by Najafi et al. in the Iranian society in 2007 entitled the relationship between self-efficacy and mental health in high school students, the reliability of the test according to Cronbach's alpha was obtained 80%. For evaluation of construct validity a questionnaire through simultaneous implementation with Symptom checklist-90 revised (SCL-90-R) was reported 0.45[21].

The intervention in the mothers of the interventional group included holding four 45 minutes training sessions and was conducted by our co-researcher in children's ear surgery department of Khalili Hospital. The first session, in which the education was related to the disease and the process of improving the child, was held as a speech on the admission of the child in the department and continued by questions and answers and the children's illness educational booklet was delivered to them by the researcher. The second session was held one day after the first session, on the child's admission to the department, in the form of face-to-face and individual training to mothers, about the care required after the transfer of the child according to the educational booklet. The third session was performed one week after the initial training sessions about short-term care after cochlear implantation surgery (How to take care of the device, the operation device, everyday life with the device ...). The fourth session was held two weeks after the initial training sessions on long-term care after cochlear implantation surgery (the effect of speech therapy and the improvement of the communication with the child and long-term impact of the care ...). In each training session, enough time was allocated for each individual according to the level of comprehension and the needs of mothers and their full justification. No intervention was performed for the mothers in the control group and they received routine care of the clinic. Data were collected by completing the questionnaires by the mothers in three stages of before intervention, on the child's admission, immediately after the intervention and two months after the intervention for both groups and necessary trainings about filling in the questionnaires were given to the mothers before completing the questionnaires by them and any ambiguity was resolved. The questionnaire coding method was used to ease the processing of the information in the questionnaire and analyzing it by computer. Data were analyzed through SPSS software version 21, using descriptive statistics (mean, standard deviation, percentage frequency) and inferential statistics (Chi-square, Fisher's exact, independent T and repeated measure). The assumption of the normality of the data before the tests was confirmed by the Kolmogorov-Smirnov test. P value less than 0.05 was considered significant.

In this study, the researcher referred to the research environment after receiving the permission from the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1396.87) and receiving the research approval from Khalili Hospital; then, the necessary explanations, regarding the research and the way it was presented and the confidentiality of the information were given to the mothers. Those who were eligible for inclusion participated in the study after obtaining written consent

Results

In this study, 70 mothers of children undergoing cochlear implant surgery were examined. (Table 2) shows the demographic characteristics of mothers and children divided into two groups of intervention and control. The mean age of the children in the intervention and control groups was 2.45±0.61 years and 2.47±0.50 years, respectively. In terms of age-match, the result of the independent t-test showed that there was no significant difference between two groups (P=0.92). Based on the results of this study, there was no significant difference between the two interventional and control groups regarding the demographic characteristics of the mother and the child (Table 2).

Table 2. Comparison of demographic variables in the intervention (N=35) and control (N=35) groups

subtype	Demographic variables	Number (%)			df	p. value*
		interventional group	Control group	total		
Mother's education	<diploma	13(50)	13(50)	26(37.1)	1.25(2)	0.53
	diploma	19(54.3)	16(45.7)	35(50)		
	BCs and more	3(33.3)	6(66.7)	9(12.9)		
Mother's age (Years old)	20-24	9(56.3)	7(43.8)	16(22.9)	0.67(2)	0.71
	25-29	10(43.5)	13(56.5)	23(32.9)		
	>30	16(51.6)	15(48.4)	31(44.3)		
Occupational status	Housewife	30(52.6)	27(47.4)	57(81.4)	0.85(2)	0.65
	Work people	2(40)	3(60)	5(7.1)		
	employed	3(37.5)	5(62.5)	8(11.4)		
Number of administration	1	28(52.8)	25(47.2)	53(75.7)	4.86(3)	0.18
	2	5(38.5)	8(61.5)	13(18.8)		
	3 or more	2(50)	2(50)	4(5.18)		
Sedative drug for mother	Yes	7(53.8)	6(46.2)	13(18.6)	0.09(1)	0.75
	No	28(49.1)	29(50.9)	57(81.4)		
Child's sex	Female	20(46.5)	23(53.5)	43(61.4)	0.54(1)	0.46
	Male	15(55.6)	12(46.2)	27(38.6)		

* Chi-square test

As shown in (Table 3), since the interaction between time and group is significant intra- group changes were made in two groups and t-test was used to check the difference between the two groups. There was no significant difference in the mean of apparent anxiety (p=0.77), hidden anxiety (p=0.91) and self-efficacy (p=0.41) of the participants between the control and interventional groups before the study. Moreover, there was a significant decrease in hidden anxiety and apparent anxiety by measuring immediately after the intervention and two months later in the interventional group (p<0.001). There was a significant increase in the level of self-efficacy of mothers, but not in the control group. (p<0.001) (Figure 2).

Table 3. Comparison of the mean score of anxiety and self-efficacy before and after intervention in control and intervention group

Variables	groups	Before the intervention	Immediately after the intervention	2months after the intervention	F statistic	p. value
		mean±s.d				
Trait (hidden) anxiety	interventional	46.48±7.93	39.71±6.29	25.42±3.22	285.96	<0.001
	Control	46.25±8.89	48±8.79	46.60±8.79	6.20	0.006
	p. value	0.91	<0.001	<0.001		
State (apparent) anxiety	interventional	47.40±8.73	40.02±6.71	26.80±3.70	277.40	<0.001
	Control	46.77±9.63	48.27±9.05	47.25±9.87	13.48	<0.001
	p. value	0.77	<0.001	<0.001		
Self efficacy	interventional	61.40±9.86	67.28±8.44	82.14±2.41	170.17	<0.001
	Control	59.42±10.42	58.11±9.83	58.68±9.95	16.25	<0.001
	p. value	0.41	<0.001	<0.001		

* Repeated measurement test. * T-test.

Figure 2: Comparison of State (apparent) anxiety of mothers between the intervention and control groups across the three study periods. It is the same information in the table 3

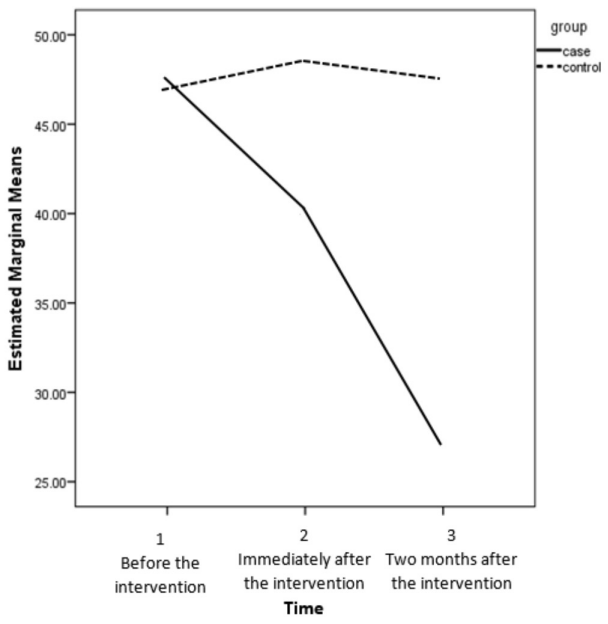
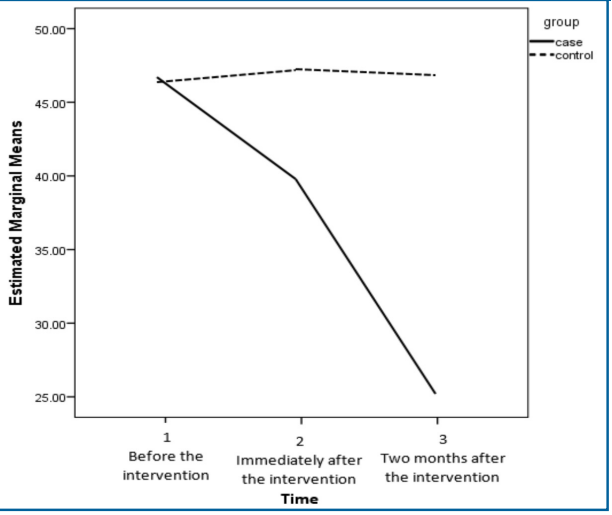


Figure 3: Comparison of trait (hidden) anxiety of mothers between the intervention and control groups across the three study periods. It is the same information in the table 3



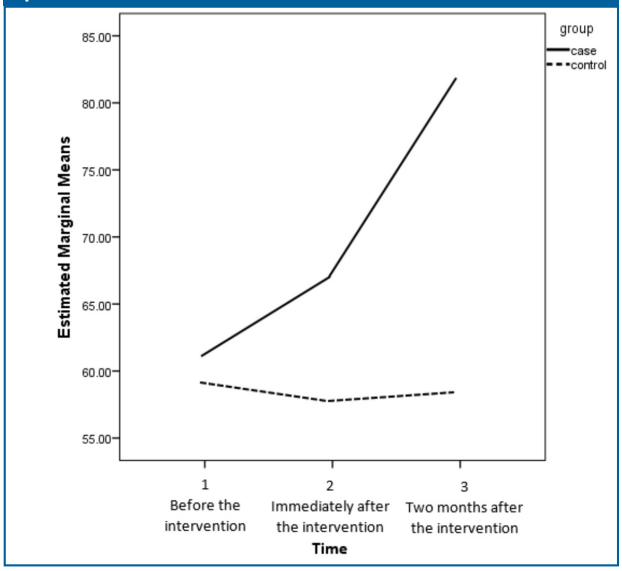
As seen in (Table 4), the difference between the mean of apparent and hidden anxiety and self-efficacy between the two groups of intervention and control, before, immediately after, and two months after the intervention was significant, using the comparison rule of the two independent groups (p<0.001) in (Figure 4).

Table 4. Comparison the mean difference of state anxiety, trait anxiety and self-efficacy before, immediately after and two months after the intervention in the interventional and control groups

Variables		groups	Dif. 1	Dif. 2	Dif. 3
Trait anxiety	m±sd	interventional	6.77±3.53	14.28±4.98	21.05±6.89
		control	-0.74±1.48	0.40±1.19	-0.34±1.02
	P value*		<0.001	<0.001	<0.001
State anxiety	m±sd	interventional	7.37±3.27	13.22±5.62	20.60±7.63
		control	-1.51±2.03	1.02±2.06	-0.48±0.95
	P value*		<0.001	<0.001	<0.001
Self-efficacy	m±sd	interventional	20.60±7.63	-5.88±3.69	-14.85±7.33
		control	1.31±1.49	-0.57±1.14	0.74±1.44
	P value*		<0.001	<0.001	<0.001

*Dif 1= immediately after the intervention – pre intervention
*Dif 2= 2months after the intervention – pre intervention
*Dif 3= 2months after the intervention – immediately after the intervention
*Mann-Whitney test

Figure 4: Comparison of self-efficacy of mothers between the intervention and control groups across the three study periods.



Discussion

This study was performed to determine the effect of educational program on the anxiety and self-efficacy of mothers of the children undergoing cochlear implant surgery. Based on the results of this study, the mean of apparent and hidden anxiety in the mothers of the interventional group, immediately and two months after the educational intervention was significantly lower than the mothers in the control group. The results of this study showed that educational intervention can significantly reduce the apparent and hidden anxiety in the mothers of children who have undergone cochlear implant surgery. Other studies in this field have been done in the past and their results are consistent with the findings of the present study.

According to the results of another study that was done aiming at investigating the effect of preoperative educational program on the anxiety of parents of children undergoing surgery and the anxiety level of the parents was measured after surgery using Spielberger questionnaire; revealed that the preoperative educational program had significantly reduced the parents' anxiety[10].

Base on a study in which the anxiety and stress of parents, 24 hours after their child's surgery were assessed, the results showed that various factors influenced the parents' anxiety, and need educational programs to reduce it[22].

Based on another study in which the effect of family-centered participation and care on the anxiety of mothers of children with gastrointestinal infection was investigate, their results showed that participation and empowerment of the parents were one of the ways to reduce the anxiety of mothers[23]. In another study also showed that education can reduce the apparent anxiety of mothers who have a child with urinary tract infection admitted in the hospital[24].

The investigation of another researcher showed that knowing the nature of the disease reduces the anxiety and abnormal behavior of parents, especially mothers, and providing the parents education with and information help them to feel they have more control and power on different situations[25]. Knowing is an essential tool that reduces the fear of unknowns and can reduce anxiety and improve parental outcomes[26]. Also, predictability and controllability of the situation plays an important role in reducing anxiety[27]. In this study, by providing the mothers with knowledge and education about the treatment process and the nature of the disease, the hospitalization and the surgical procedure of their child that makes much anxiety for them becomes more tolerable and it seems that their ability to adapt and the use of coping strategies increase and this reduces the anxiety of the mothers of these children[24].

Another finding of this study was the significant increase in the mean of self-efficacy in the interventional group mothers immediately and two months after the intervention, compared to the mothers in the control group[28]. In other words, according to our study educational intervention can remarkably increase the self-efficacy in mothers of children undergoing cochlear implant surgery.

The results of this study are consistent with which was done to determine the effect of educational program on the quality of life and self-efficacy of mothers of infants with congenital heart disease, and results showed that mother's self-efficacy scores significantly increased[29].

Also in a study, the effect of educational support program on the self-efficacy of mothers of children with epilepsy was investigated and the results showed impressive significant increase in the self-efficacy score in the interventional group compared to the control group[27].

Based on the results of the present study, it seems that reducing the anxiety of mothers by providing them with education has been effective in increasing their self-efficacy. Parents need knowledge and necessary information about the disease, treatment process and effective ways of caring for their children in order to enhance their self-efficacy[30]. In this regard, the implementation of educational programs for parents is an effective solution that can increase knowledge, improve performance and subsequently increase self-efficacy in parents by providing information they need.

Conclusions

According to the results of this study, educating the mothers of children having undergone cochlear implant surgery can reduce their anxiety and increase their self-efficacy. Nurses, as important members of the health team who have close interaction with the parents and children during hospitalization, can play an effective role in improving self-efficacy and reducing the anxiety of the parents by relying on their knowledge and experience and providing the appropriate educational program.

Study limitations:The samples in the present study were collected only from the educational hospitals affiliated to Shiraz University of Medical Sciences. Thus, the results might not be generalized to other kind of hospitals.

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