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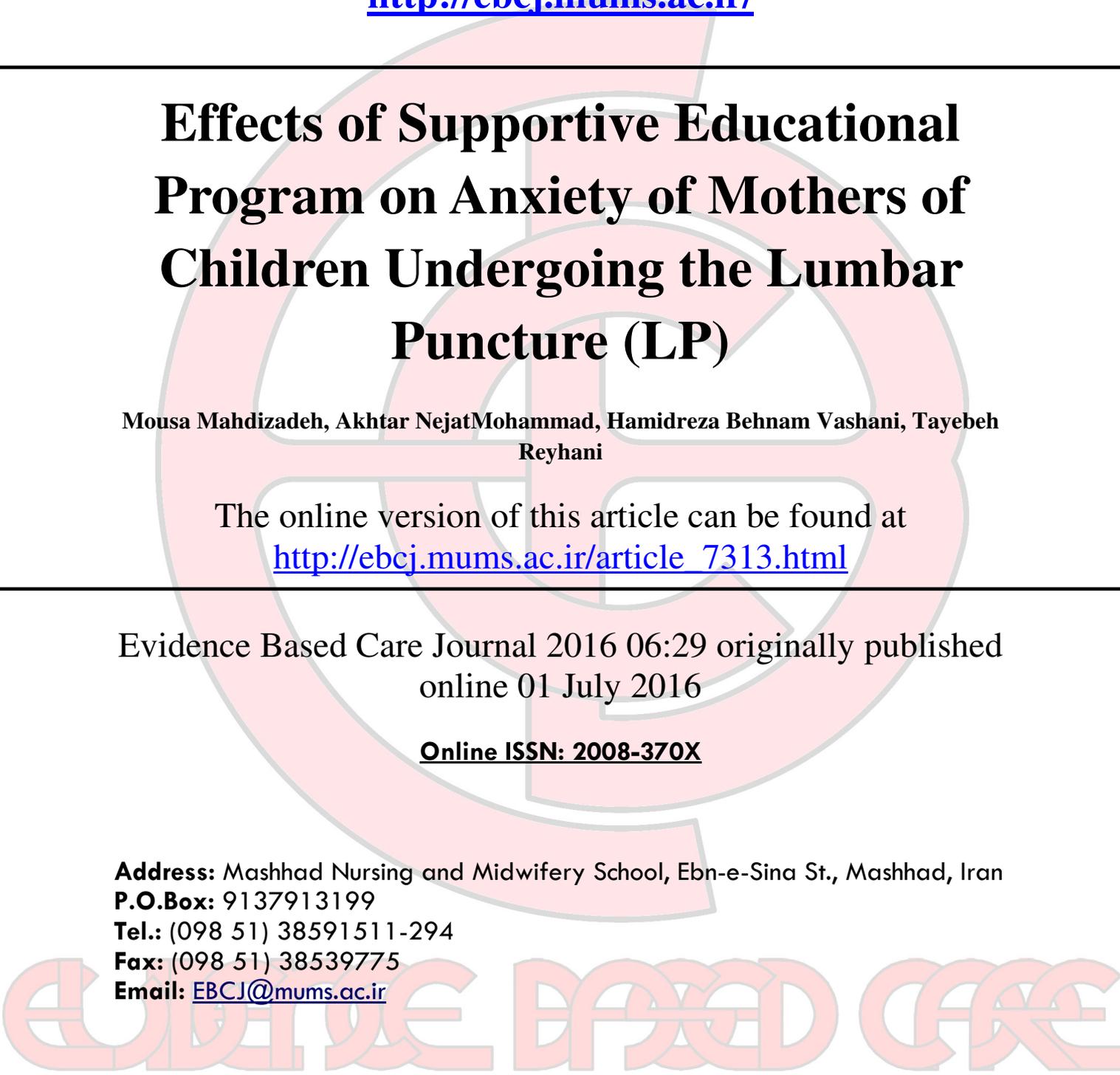
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Effects of Supportive Educational Program on Anxiety of Mothers of Children Undergoing the Lumbar Puncture

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Abstract

Background: Lumbar Puncture test is one of the most stressful diagnostic procedures in pediatric ward that its prescription put mothers under extreme pressure. There are limited interventions in this regard.

Aim: determining the impact of supportive educational program on the anxiety of mothers whose children are undergoing lumbar puncture (LP).

Method: the present study is a randomized controlled clinical trial carried out in 2015. Sixty mothers of children undergoing lumbar puncture and hospitalized 3educational hospitals of Mashhad, Iran, were randomly divided to control group (n=30) and intervention group (n=30). The intervention group received supportive program during a session of 60 min. Spielberger State-Trait Anxiety Inventory (STAI) was selected as the research tool. Finally, data were analyzed by Chi-square test, independent t-test using SPSS v.16 software.

Results: The mean age of the mothers was 27.3 ± 5.3 and 26.0 ± 3.1 , respectively. The mean pre-interventions maternal manifest anxiety was 51.9 ± 6.2 and 53.4 ± 4.3 out of 80, respectively, in the intervention and control groups. The mean post-interventions maternal manifest anxiety was 44.9 ± 5.1 and 52.7 ± 4.2 , respectively, in the intervention and control groups. According to the results of independent t-test, significant difference was observed statistically for the mean maternal manifest anxiety between the two groups ($p < 0.001$).

Implications for Practice: Regarding the reduction of maternal anxiety in the intervention group, which is possible because of the attention to the emotional needs of mothers, in addition to proper training; this program can be considered as an effective method to reduce maternal anxiety before the LP test.

Keywords: Education, Support, Anxiety, Lumbar puncture

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Introduction

Eighty percent of hospitalized children receive invasive procedures; in spite of being short-term, they could lead to an undesirable experience and subsequent stress for the child, the parents, and health care personnel (HCP) as well [1,2].

Lumbar puncture test is one of these invasive procedures leading to extreme parental anxiety [3].

This diagnostic method is an extremely necessary as well as urgent measure in all children and infants suspected of having brain infection or infection of the brain membrane [4, 5].

LP test is highly recommended by researchers for all children referring to hospital with febrile and seizures. Due to the aforementioned fact, LP test is believed to be the best and most valid means as well as a golden standard in diagnosing Meningitis in children [6, 7]. According to the reports, approximately 2000 new patients affected by Meningitis are annually undergone the Lumbar puncture test by health care centers and hospitals of the country [8]. However, in spite of its significant role in recognizing some diseases in children, Lumbar puncture test frequently creates parental anxiety leading to avoidance and un-satisfaction of the latter to agree the aforementioned test for the children due to its invasiveness compared to other routine tests [6, 9].

Numerous studies in and out of country have been carried out with the aim of investigating the influencing factors in this sort of anxiety and unwillingness of parents in performing this test. For example, the research performed by Narchi (2013), indicated that false beliefs and perceptions of parents in terms of the possible implications of this test, e.g. child paralysis, mental retardation, infertility problems, scoliosis and cerebral infections have led to the intensification of parental anxiety and their avoidance of performing this test on their children [9]. Wong (2010) and Khakshour (2013) in their studies on the causes of parental anxiety concluded the results consistent with the findings of Narchi [6, 10]. In one hand, the parental anxiety and unwillingness about this test may lead to some complications for their children, the commencement of prescribing unnecessary antibiotics for children, accelerated antibiotic resistance, extra financial cost for families, further and unnecessary working pressure for the nursing personnel, and more significantly permanent physical hurts and implications resulted from delayed diagnosis [3]. Moreover, there are a number of evidence revealing emotional interactions between children and parents and anxiety transmission from parent to child [11]. Therefore, identifying anxiety and its stimulating causes in parents is a matter of utmost importance due to its negative impacts on the treatment process of the child [12, 13].

Khakshour et al. (2013) attributed the main causes of these false attitudes and beliefs of parents to the lack of information concerning the diagnostic procedure (Lumbar puncture test), uncertainty of the prognosis of children, and receiving inaccurate information in consulting with acquaintances [6]. Furthermore, reviewing the relevant previous studies, for example, Aein (2009), with the aims of investigating the needs of mothers of hospitalized children imply that parents desire to be persuaded about the reason of performing therapeutic and diagnostic procedures and provided by sufficiently transparent and comprehensible information to be able to make decision in terms of the care and treatment of their children [14]. Schaffer et al. (2000) also presented a research in this regard, reporting the necessity of providing accurate information and assurance to the parents and support for their general needs in critical condition [14, 15].

Meeting the medical care objectives in the treatment process of children may require increased information acquisition on behalf of mothers to reduce their anxiety and increase their ability to make decision in this respect [16]. From another point of view, adequate preparation is considered to be a way to help parents in performing invasive procedures and having a successful and positive experience [17]. Additionally, supporting families and providing them with information and training may lead them to feel more control and strength in stressful conditions and approach their expectations of the outcomes of the respective disease to the real condition [16].

As one of the medical personnel having the most contact with children and their parents, nurses have highly considerable role in training, they are required to take into account the family in addition to the patient in their educative programs and provide an exact, consistent, need-driven, and comprehensive program to meet the needs of the parents for receiving adequate information [18], and help the latter to go through this stressful condition with less tension and anxiety by relying upon their own knowledge, information, and experience [11]. What is more, regarding the fact that the results presented by many studies are representative of the fact that the mere informational support of nurses fail to be effective in reducing the anxiety of families [18]. Hence, nurses are better to pay attention to the emotional needs of patients in addition to educative programs; use emotional interventions along with educative ones in interacting patients; inspiring them to express their emotions and excitements (emotional support); and also supporting them in critical condition (11, 19).

In this study, educative-supportive program was prepared as a new mechanism based on supportive cares provision (informational and emotional) for mothers, and implemented as a combination of face-to-face training, question and answer, electronic training, and educative pamphlets.

The integrated educational method with a holistic approach towards the learner and by considering individual features including attitudes, beliefs and perspectives, level of knowledge, and mental competency provides an opportunity for question and answer by the patient. Hence, it may pave the way for the latter to talk about any concerning issue or question with the researcher and alter his/her false beliefs [11].

Regarding the fact that most studies done in the country and abroad in domain of this diagnostic test have tackled the parental anxiety before the lumbar puncture test [6,9]; and also because there were limited interventions aimed at reducing the parental anxiety, particularly that of mothers, before the lumbar puncture test, and more notably, concerning the contradictory results presented by some studies in terms of the impact of training on the anxiety indicated the effective role of increased knowledge and information in reduced anxiety of the patients; on the contrary, as some researches have reported that providing knowledge and training for patients and their acquaintances may not only fail to reduce their anxiety, but make them more sensitive and increase their anxiety as well [22,21], implementing a structured and developed protocol and investigating its effectiveness in reducing the maternal anxiety before the Lumbar puncture test seem to be necessary in the present cultural conditions. Therefore, the present study aims at investigating the impact of supportive educational program on the maternal anxiety about children undergoing the Lumbar Puncture.

Methods

The present study is a randomized controlled clinical trial done in 2015 (since July for 4 months) on mothers with children undergoing Lumbar Puncture in the emergency unit of Children's hospital of Dr. Sheikh and children ward of Ghaem, and Imam Reza hospitals, Mashhad, Iran.

A preliminary study was done on 20 qualified mothers with children under Lumbar Puncture test. Considering the significance level of 95%, test power of 80% and the formula of standard deviation and mean comparison of two studied societies through computing the mean and standard deviation of manifest anxiety of control group (42.5 ± 4.0) and intervention group (41.5 ± 4.1); the sample size was considered 27 individuals for each group. However, considering 10% sample size attrition, the final sample was 30 subjects.

At the beginning of the study, for avoiding increased homogeneity of the two groups and the impact of intervention group on the control group, a simple random choice was done between two groups to determine from which group (control or intervention) the sampling has to be commenced. Consequently, intervention group was selected as the first group. Then, accessible sampling was used in this group among the mothers of children undergoing Lumbar Puncture test, who had the required criteria to be included in the study. After the completion of sampling in intervention group, sampling in its counterpart group, i.e. control, commenced and continued up to the completion of all sample

size (n=30). The whole process of sampling took 4 months (from July to October 2015), the first eight weeks were assigned to intervention group and the following eight months were dedicated to the control group.

The inclusion criteria required for mothers included having willingness to participate in the study, age more than 18 years, the knowledge of reading and writing, taking no hypnotic pills or tranquilizers two days before intervention, experiencing no stressful events, such as the death of First-degree relatives or sever domestic conflicts during the last 6 months, acquiring the anxiety score of higher 31 in STAI. Further point is that merely children from 1-14 years old were included in the study (regarding the age condition of children admitted in Ghaem hospital, Dr. Sheikh hospital, and Imam Reza hospital in Mashhad). On the other, exclusion criteria included withdrawal or unwillingness of parents to continue their cooperation in the study at any time and urgent prescription of Lumbar puncture test for the child (there was no more than 1 hour for the test).

Mother-child demographic information questionnaire and Spielberger state- trait anxiety inventory were used as the data collection tools. The former composed 22 questions in two sections. The first section included 15 questions about the demographic information of the mother (e.g. age, marital status, educational level, place of residence, occupation, number of children, insurance state), and the second section included 7 questions in terms of the demographic information of the child (e.g. age, sex, hospitalization unit, cause of hospitalization, duration of hospitalization, history of hospitalization). The aforementioned questionnaire was prepared given the objectives of the study and according to the newest related resources and papers.

Spielberger state- trait anxiety inventory known as STAI includes two individual 20-question scales to measure visible and invisible anxiety as self -assessment way. The visible anxiety is assigned to stressful conditions threatening the security and the life of man, while invisible anxiety refers to the individual differences with different levels of visible anxiety in stressful conditions. The validity as well as the reliability of the aforementioned questionnaire was confirmed in the study presented by Tol et al. (2010) [23].

Scoring of the tool was as follows: each question is scored based on Likert scale (very low (1), low (2), high (3), very high (4)); hence, the overall score ranges from 20 to 80. In this tool, the high scores are representative of the higher anxiety, while the low scores imply the lower anxiety. According to the interpretive criteria, minor, low to mediate anxiety, mediate to higher, relatively high, high, and very high anxieties are defined by, respectively, 20-31, 32-42, 43-53, 54-64, 65-75, and more than 76 scores. In the present study, reliability was computed by internal consistency equal to 0.89 by Cronbach's alpha.

Intervention in this study was done in a way that after performing the required arrangements, the researcher held the supportive educational program designed for the respective study in a 60 min session (due to the time restriction from prescription time to the test time) followed the participants selection (before the child Lumbar puncture test) for the intervention group as individually in two sections, i.e. educative and supportive. Integrative education including face-to-face educating, supportive film, question and answer, and educative pamphlets were used to implement the supportive program for the mothers.

The first part of the program was educative aspect. The researcher firstly presented explanations in terms of the procedure (in 30 min) as face-to-face education. Then using educative slides prepared as PowerPoint (the content included: the definition of cerebrospinal fluid, spinal fluid functions, the case in which this test is prescribed, pre- and post-care measures of the test, side effects of not doing the test, side effects) for mothers. In this way, before presenting each topic, participants were asked about the respective issue as question and answer, and then the educative materials were presented. The second half of the program was dedicated to emotional support taken 30 min. In this section, researcher firstly communicated the mother and gave her the opportunity to express her attitudes and

concerns about this test. Then the respective mother was shown the first sequence of the supportive film including interviews with several parents whose children were undergoing Lumbar Puncture. During the film, the explanations of each mother followed by scientific explanations of pediatric infectious disease specialist about these negative concerns in mothers. After showing the first sequence of the film, the researcher sympathized the mother and assured her about the safety of the respective test. Afterwards, for the sake of more assurance of the mother, the second sequence of the film was shown (included the interviews with people having performed the test years ago devoid of any side effects; moreover, the comments of pediatric specialist based on his several-year experiences of performing this test for a hundred of children were presented).

At the end of the supportive program, an educative pamphlet based on the recognized needs of mothers and research objectives, which had been prepared according to the valid scientific resources including reference books and literatures and its validity had been confirmed by experts (e.g. pediatric specialists and a number of nurse faculty members) was presented to mothers. The point that should be clarified here is that, the supportive educational program of the study was prepared in a way to be comprehensible even for low educated mothers.

Spielberger state- trait anxiety inventory was completed as self-reported way in two steps, i.e. before the intervention and after the completion of supportive program (immediately before the Lumbar puncture test) by the participants of control group and intervention group.

Individual training and mother participation in the educative program, were used in holding this supportive program. Control group received no intervention on behalf of researcher, but routine trainings of the unit by the nurses.

In all steps of the study, all Code of Ethics approved by research deputy of University of Medical Sciences which were related to the present study including acquisition of a written approval from the ethics committee of the University, receiving the written letter of introduction from the Faculty of Nursing and Midwifery and submitting it to the directors Dr. Sheikh, Imam Reza, and Ghaem hospitals, receiving informed consent from the study participants, coding the questionnaires to maintain the confidentiality in a case that participants may decide to exclude the study due to their unwillingness in continuing the study, were observed.

The data compiled was analyzed by SPSS v.16 software. Kolmogorov-Smirnov test and Shapiro-Wilk test were used to investigate the natural distribution of quantified data. Moreover, chi-square, Fisher's exact test, and independent t-test were used in the study to examine the homogeneity of the variables.

Independent t-test and paired t-test were used for intergroup comparison and intragroup comparison of the variables, respectively. Pearson and Spearman correlation coefficient was also used to summarize as well as analyze them. Confidence level and significance level of, respectively 95% and 0.05% was considered for the study.

Results

Statistical tests failed to indicate a statistically significant difference in terms of demographic variables between intervention and control groups ($P > 0.05$). The aforementioned groups were homogenous from the perspective of demographic characteristics, e.g. the age of mother, educative degree, place of residence, insurance state, the history of child hospitalization (table 1).

The result of independent t-test in intergroup comparison indicated that there is no statistically significant difference ($p = 0.30$) in the mean maternal manifest anxiety between the intervention group 51.9 ± 6.2 and control group 53.4 ± 4.3 , in pre-intervention step. In post-intervention step, there was a statistically significant difference ($p < 0.001$) in terms of the aforementioned variable in mothers of intervention group 44.9 ± 5.1 and that of the control group 52.7 ± 4.2 (table 2).

The results of paired t-test showed that there is a statistically significant difference ($p < 0.001$) in the mean maternal manifest anxiety in intervention group before and after the intervention. While, such a difference failed to be significant in control group ($p = 0.40$) (table 2).

Furthermore, the results of Pearson and Spearman correlation coefficient indicated that there is a statistically significant difference between none of the mothers' demographic characteristics and maternal manifest anxiety ($p > 0.05$).

Table 1- Comparison of the demographic characteristics of participants

Variable	Intervention group Number (%)	Control group Number (%)	Test result
Educative degree	Elementary	10 (33.3)	P= 0.09*
	Guidance school	8(26.7)	
	High school	8(26.7)	
	Higher	4(13.3)	
Insurance	Yes	23(76.7)	P=0.70****
	No	7(23.3)	
Place of residence	City	24(80)	P=0.50**
	Village	6(20.0)	
History of hospitalization	Yes	2(6.7)	P=0.07**
	No	28(93.3)	
The mean age of mother	27/3± 5/3	26.6±4.3	P=0.29***

* Exact Chi-square
 ** : Fisher's exact test
 ***: Independent t-test
 **** Chi-square

Table 2- Comparison of maternal manifest anxiety level before and after intervention in the intervention and control groups

Maternal manifest anxiety	Intervention group Mean± SD	Control group Mean± SD	The result of independent t-test
Pre-intervention	51.9±6.2	53.4±4.3	t=1.0* p=0.30
Post-intervention	44.9±5.1	52.7±4.2	t=6.3* p<0.001
The result of paired-t test	t=4.5** p<0.001	t=0.8** p=0.40	*: Independent T-test **: paired t-test

Discussion

The present study aims at determining the impact of supportive educational program upon the maternal anxiety whose children were under Lumbar Puncture. According to the findings of the present research, after implementing the supportive educational program, the mean maternal manifest anxiety in intervention group significantly reduced compare to the control group. In other words, supportive educational program can lead to reduced anxiety by providing information in terms of Lumbar puncture test and emotionally supporting mothers. Given the fact that no similar study in this regard was found, the most related studies were referred for the sake of comparison and discussion about the results.

Enadi et al. (2015) performed a study entitled "Effects of training on anxiety in mothers of hospitalized children with urinary tract infection" on children hospitalized in Ghods hospital in Ghazvin. The results indicated that the level of visual maternal anxiety in intervention group was lower significantly (statistically) compared to control group after training [24]. The provided trainings in this study have some overlaps with the present study in terms of informational support. Additionally, in this study the supports in another facet, i.e. emotional support, was also provided for the mothers participated in the study and could meet the needs of the mothers and reduce their anxiety as well.

Nik Farid et al. (2008), in their study “investigating the impact of preparing Leaflet on the anxiety level of mothers in day when their children had outpatient surgery” in Saveh. In their work, intervention group received preparing leaflet about the pre-operation preparations. Then, at the operation day, after transferring their children to the operation room, mothers completed the Spielberger state- trait anxiety inventory. The findings were representative of the fact that, the mean maternal manifest anxiety in intervention group is lower significantly (statistically) than the control group. The results of this study are consistent with the results found in the present research. In their study, a leaflet includes required points for preparing children for the invasive procedures, a description of what the children and their parents are going to face, and guiding points for cares after the operation. The aforementioned matters are in line with the informational supports of the present study. Moreover, the findings of the present study showed that providing emotional supports along with informational supports could significantly decrease the maternal anxiety.

The findings of the present study concord the results concluded by “Use of a pre-anesthetic video for facilitation of parental education and anxiolytics before pediatric ambulatory surgery” by Cassady et al. (1999). In their study, the mean maternal manifest anxiety in intervention group was lower significantly (statistically) than the control group [25]. In the present study also, after intervention, the maternal anxiety significantly reduced. While, in control group the mean of difference in manifest anxiety failed to be statistically significant. However, in the present study, in addition to showing film, individual training, question and answer, and educative pamphlet provision were also used. The aforementioned supports could help mothers in controlling their condition, provide the opportunity for question and answer to talk about her concerning issues with the researcher and to alter her false beliefs and attitudes in terms of the respective test, and finally led to the reduced maternal anxiety.

In the study “the effect of an educative program on the parental anxiety during the anesthesia on their children”, Chine et al. (2002) indicated that timely interaction with the families, providing them adequate training, and appropriately sympathize them can result in reduced parental anxiety [26]. The results of this study are in agreement with the results found in the present one. Given the findings of the study, measures such as information support and emotional support of the mothers by nurses can help the former to have more compatibility in facing this stressful condition and approach their expectations about the outcome of the test to the reality. As Beal & Quinn (2002) in their study entitled “the role of nurses towards the parents of children hospitalized in ICU” emphasized the provision of training-supportive needs of mothers. In their conclusions, the most significant tasks of nurses towards the parents were provision the comprehensible trainings for the parents as well as reassuring them [27]. Similarly, in the present study also meeting the educational-emotional needs of mothers was effective in reducing their anxiety.

Imanpour et al. (2012) performed a study entitled “investigating the effectiveness of informational support for domestic caregivers of patients undergoing open heart surgery on their anxiety”. Their results fail to be consistent with the results presented in the present study. The cause of such an inconsistency refers back to the procedure and the type of training program. For instance, in their study, the emotional support aspect of domestic caregivers in reducing their anxieties failed to be taken into account and it was shown that mere training program fails to reduce the anxiety. However, in supportive educational program of the present study, the researcher firstly identified the training needs of mothers and then increased their knowledge of and attitudes towards the test. After the aforementioned needs of the mothers were met, their emotional needs were considered. What is more, integrative training as the strength point was also used to train the intervention group in the present study.

In the present study, the importance of providing informational-emotional supports on behalf of nurses was taken into account. The results were representative of the effectiveness of such supports on the reduced maternal anxiety in performing Lumbar puncture test on their children. It is also in

concordance with the results concluded by Zakeri Moghadam et al (2014) in their study “examining the impact of supportive program on the parental anxiety of patients during the coronary artery bypass surgery”. In their study, families received supports in two aspects, namely informational and emotional. The results of the above-mentioned study revealed that promoting informational and emotional supports to the families of the patients could reduce their anxiety [28].

Self-report method of completing Spielberger state-trait anxiety inventory and time restriction in training since prescription to Lumbar puncture test for children is considered the limitations of the study, which failed to be removed by the researcher. Moreover, the researcher had a limited time for training himself.

Implications for Practice

The results of the study indicated that participants of intervention group received the supportive educational program experienced lower anxiety compared to the control group. Therefore, measures such as nursing support including informational and emotional supports can effectively reduce the maternal anxiety. Appropriate integration of different educative media effectively support mothers individually, provision of easily comprehensible materials and more importantly taking into account the emotional needs of mothers along with meeting educative needs can be considered as the possible causes of effectiveness of this supportive program. Hence, the aforementioned program can be used in stressful procedures for mothers. Further studies are recommended to be done to compare the impact of supportive educational program on the maternal anxiety with other educative methods.

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Conflict of interest

The authors declare that there is no conflict of interest.

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