



Patient Education-Based Approaches to the Control of Anxiety in the Children Receiving Treatment: A Systematic Review

Hadi Shahrabadi¹, Shahrbanou Talebi^{2*}, Ali Vahidi Sabzevar³, Seyyed Mohsen Asghari Nekah⁴

1-MSc in Exercise Physiology, Sabzevar Education, Sabzevar, Iran

2-MSc in Nursing Education, School of Nursing and Midwifery, Sabzevar University of Medical Sciences, Sabzevar, Iran

3-MSc in Critical Care Nursing, Health Care of North-East Petroleum Industry, Sarakhs, Iran

4- PhD, Assistant Professor, School of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

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***Corresponding author**

Shahrbanou Talebi

Email:

shtalebi95@gmail.com

Tel:

0989156591705

ORCID iD:

0000-0002-2647-6870

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ABSTRACT

Background & Objective: Child hospitalization is one of the sources of anxiety for the child. The present study aimed to review the patient education-based approaches used to control anxiety in the children receiving treatment.

Materials and Methods: This systematic review was conducted via searching in databases such as Google Scholar, Cochrane, PubMed, Scopus, and ScienceDirect to identify and select the articles published in English and Persian during 2000-2016. Initially, 1,216 relevant articles were identified, and the full text of 41 articles was reviewed.

Results: In terms of location, nine studies were conducted in Iran, and the other papers were published in the United States, United Kingdom, Germany, China, and Brazil (one article each). Among the reviewed papers, play therapy was used in five cases, story books, pamphlets and face-to-face training were applied in two cases, and storytelling, visual concept maps, videos, web tips, and a mental preparation program were applied together in one study. Most of the studies indicated that patient education-based methods could reduce the level of anxiety in the children receiving treatment.

Conclusion: According to the results, most training approaches have a remarkable impact on reducing the anxiety of patients. However, some strategies have a particularly significant effect on the anxiety in children, such as pamphlets and face-to-face training. Few studies have compared the effects of various training methods on the anxiety level of patients, and therefore, further investigation is required to confirm the effects on the reduction of anxiety.

Introduction

Hospitalization is associated with various psychological complications, which may evoke different responses in patients due to the changes in the normal pattern of life. In some cases, hospitalization could intensify psychological responses such as fear and anxiety.

Rates of anxiety and depression are reported to be higher in the children admitted to hospitals compared to other patients. This is generally due to the restraint of the child in defense mechanisms, such as problem-solving, decision-making, self-centered view of children toward the world, and their limited experience, which give rise to fear under threatening circumstances. Some of the most severe anxiety-causing factors in school-age, hospitalized children include encounters with strangers, prescribed dietary patterns, separation from the family, being in an unfamiliar environment, the treatment process, and lack of control (1). Anxiety during hospitalization depends on the maturity of children, background of separation from the parents, history of hospitalization, and available support systems (2).

Surgery is a common procedure in hospitals, which is considered to be a stressful event for every individual (3). Surgery may be scheduled or unplanned, small or large, invasive or non-invasive, targeting various systems in the body (4). Regardless of its type, surgery is a daunting experience since it poses risk to the integrity of the body and might occasionally be life-threatening (5). Preoperative anxiety not only disturbs the children with prior experience of surgery, but it also has an adverse effect on their

postoperative recovery (6). Lack of knowledge about hospitalization and surgery may lead to preoperative and postoperative anxiety. Explaining about unfamiliar situations and proper training of patients have been shown to decrease the anxiety of patients (1). Squyres defines patient education as the combination of the programs and learning activities designed for patients to change their health behaviors. In some countries, the healthcare system has set specific laws regarding the training of patients.

In 1975, the American Medical Association (AMA) assigned a task to general practitioners to train patients on their health status. The AMA has emphasized that patient education plays a pivotal role in medical professions, highlighting the need to consider such instructions due to the high prevalence of chronic diseases and increased public awareness regarding their rights. Furthermore, it has been specified in the patients' rights charter that patients are entitled to being informed on their health status, treatments, the possible risks and benefits of treatments, other healthcare options, their ongoing healthcare needs, and healthcare rules and regulations (7).

Evidence suggests that patient education is an effective healthcare intervention, which reduces the costs of health services and improves the quality of care (8). As one of the most important members of the healthcare team, nurses have more interactions with patients than the other healthcare providers. As a result, patients are more comfortable with nurses and can easily ask their questions or share their fears and

concerns with these professionals. When nurses communicate with the patients who are ready to learn, they can revolutionize the patient's life. Provision of care instructions by nurses has been shown to reduce the symptoms and anxiety in patients, decrease readmission rates, improve the quality of life of patients, and clarify the disease and effectiveness of treatment procedures (7).

Recognizing the needs and emotions of hospitalized children is the foundation of detecting the sources of their fear and anxiety, which in turn contributes to their treatment and selecting the appropriate method to reduce fear and anxiety. Several approaches have been proposed to discern the emotions and thoughts of children. For instance, children use storytelling in order to implicitly express their emotions and needs. In addition, games enable children to explore their feelings without any threat. The potential internal concerns of children may also manifest readily through arts rather than verbal communication. On the other hand, using dolls and medical equipment in the form of toys are stimulating to children. In addition to entertainment using the mentioned tools, physicians and nurses can teach children to use these tools in order to reduce their fear and anxiety, while providing effective behavioral training (1).

Considering the role of patient training in treatment processes and the increased rate of anxiety in hospitalized children, the present study aimed to determine various patient education-based approaches to the control of anxiety in children during hospitalization.

Materials and Methods

This systematic review was conducted via searching in databases such as PubMed,

Google Scholar, Cochrane, ScinceDirect, and Scopus. Collection of the articles was performed during October-November 2016, and the studies published during 2000-2016 were targeted in the literature search.

In the initial search, we used keywords such as child, school, pediatric, nurse, psychology, hospitalized, hospital, surgery, play, preoperative, preparation, therapeutic, procedure, behavior, education, anxiety, program, story, book, face-to-face, concept map, visual, orientation, leaflet, verbal, web, cancer, information, anesthesia, care, non-pharmacological, storytelling, video, injective, and clinical. In the next step, we used keyword combinations search.

According to Figure 1, 1,216 papers were initially identified in the literature search. After reviewing the full text of 41 articles, 16 original research articles (semi-empirical studies) were selected for further evaluation. In order to assess the validity of the methodologies applied in the selected studies, the articles were investigated using the JBI Meta-Analysis of Statistics, Assessment, and Review Instrument (JBI-MAStARI) (Table 1).

The articles that met at least six of the inclusion criteria (total: 10 criteria) were selected for the current review. In total, 14 papers were investigated. Irrelevant articles, those published in other languages than English and Persian, abstracts, repetitive studies, those with invalid methodology, dissertations, congresses, letters to the editor, review articles, case reports, and testimonials were excluded from the study.

Literature search and evaluation of the articles were performed by three researchers, who collected the required data of the

retrieved articles, including the author(s), year of the study, study objectives, details on the interventions, demographic data of the subjects, sample size, causes of sample loss or withdrawal from the study, methodologies, and research findings as the raw data of the current review using a standardized form.

Reliability of the methodologies in the selected studies was confirmed via the following approaches:

1. Three researchers carried out the reliability analysis process independently.
2. Three researchers simultaneously confirmed the results of the analysis, and in the case of conflicts, made a compromise in the review of the articles.

Results

Among the selected articles (n=14), nine studies were performed in Iran, and the other cases were carried out in the United States, United Kingdom, Germany, China, and Brazil (one article each). All the selected articles were experimental and quasi-experimental studies. In addition, most of the studies were clinical trials (9-18), and the research units were selected via randomized methods (e.g., random allocation, lottery, random numbers, and permuted block randomization, with the exception of the study by Bazmi and Narasi (2013).

In the studies using the index of the American Society of Anesthesiologists (ASA), children were in class I and II (9-11, 14) and within the age range of 3-16 years. In the selected studies, 1,320 children were

assessed. Details of the selected articles are presented in Table 2.

Among 14 studies, five cases were focused on the anxiety in hospitalized children (15, 16, 18-20), one study investigated the anxiety caused by injection procedures in thalassemia patients (21), one research was focused on the anxiety caused by dental treatments (9), and seven studies assessed the anxiety associated with surgeries (10-14, 17, 22). In all the selected articles, types of the interventions were non-pharmacological and patient education. In terms of the methodology, five studies used play therapy (13, 17, 19-21), two studies applied story books (12, 15), pamphlets (10, 14), and face-to-face training (15, 16), and storytelling (18), visual concept maps (16), videos (9), web tips (11), and a mental preparation program (22) were all adopted in one research.

The current survey aimed to instruct patients on the following 1) introduction to hospitalization, anesthesia, surgery, and injection procedures; 2) recognition of medical and dental equipment, hospital room, operating room, waiting room, and recovery room; 3) introduction to the hospital personnel; 4) introduction to the expected sensory experiences (e.g., pain, itching, and irritation) during the treatment process; 5) recognition of behavioral instructions (e.g., breathing before induction, effective and harmful activities before and after the treatment) and 6) reducing anxiety in hospitalized children.

The equipment used in the reviewed studies included photos, television, videos, CDs and DVDs, tablets, computers, laptops, internet websites, games room, dolls looking like

children, toys, medical and dental equipment in the form of toys, books, pamphlets, maps, visual concept maps, sketchbooks, drawing books, colored pencils, and handicrafts.

In the majority of the reviewed studies, the research units were allocated to two groups of intervention and control (9-14, 17, 18, 20-22). However, in the study by Shahrabadi et al. (2016), the research units were divided into three groups of storybook, face-to-face training, and routine care. Moreover, Talebi et al. (2015) adopted two strategies, including visual concept maps and face-to-face training, in order to reduce anxiety in children. Bazmi and Narasi (2013) also investigated the research units in an intervention group only.

The stages to measure anxiety were different in the reviewed studies. In the studies by Shahrabadi et al. (2016) and Talebi et al. (2015), anxiety was assessed upon admission and at discharge, while in the research by Zarei et al. (2013), anxiety measurement was performed on the first and sixth day. Asghari Nekah et al. (2015) and Bazmi and Narasi (2013) also measured anxiety levels upon admission (exact time not stated), while Hamed Tavasoli et al. (2012) noted two phases before the injection procedures. In the studies by Sadegh Tabrizi et al. (2015), Cumino et al. (2013), Majzoobi et al. (2013), and Vaezzadeh et al. (2011), the stages of anxiety evaluation were carried out before anesthesia and surgery. As for the research conducted by Felder-Puig et al. (2003), the two stages of anxiety measurement were reported to be before and after surgery.

In some studies, anxiety was assessed in more than two stages. For instance, Li et al.

(2007) measured anxiety in three phases before and after surgery, while Fortier et al. (2015) stated three stages of separation from parents, upon entering the operating room, and while attaching the anesthesia mask. Furthermore, Al-Namankany et al. (2015) performed anxiety measurement in eight stages, including in the waiting room, upon entering the dental clinic, while sitting on the dental chair, during the examination with a mirror, upon nasal mask application, while administering local anesthesia, during tooth drilling and tooth extraction, at two stage before watching the movie and starting the anxiety treatment.

The tools used for the anxiety assessment in children included the State-Trait Anxiety Inventory for Children (STAIC), Chinese version of the State Anxiety Scale for Children (CSAS-C), Spielberger State Anxiety Scale for children (SSAS-c), Revised Children's Manifest Anxiety Scale (RCMAS), Hospital Anxiety and Depression Scale (HADS), modified Yale Preoperative Anxiety Scale (m-YPAS), Abeer Children Dental Anxiety Scale (ACDAS), visual analogue scale (VAS), Hamilton anxiety questionnaire, Scale of facial self-reported anxiety, a short checklist to assess fluctuating mood states, and Draw-a-Person test.

Although the target group of the current review was hospitalized children, some of the studies evaluated parental anxiety as well (10-15). In addition to measuring anxiety in children, Bazmi and Narasi (2013) examined the general adaptation and positive emotions of children, Majzoobi et al. (2013) inspected the heart rate and systolic and diastolic blood pressure of

children, Asghari Nekah et al. (2015) explored the depression level of children, Talebi et al. (2015) addressed fear in children, and Li et al. (2007) and Fortier et al. (2015) investigated the level of pain and emotional behaviors of children and parental consent and pediatric anesthesia emergence delirium (PAED), parental coping, and child temperament, respectively.

In the majority of the reviewed studies, there were no discussions on the blinding of research units (10-12, 14-16, 18-22). However, in the studies by Li et al. (2007) and Vaezzadeh et al. (2011), the researchers employed a single-blind approach. Moreover, the participants and dental groups were undiagnosed in the study by Al-Namankany et al. (2015). It is also noteworthy that in the articles that examined the demographic variables of the subjects (9-18, 20, 21), the study groups were not homogenous in terms of these variables ($P>0.05$).

Anxiety in Hospitalized Children

After performing the training program on the intervention group, the anxiety in hospitalized children was reported to reduce significantly in the studies by Bazmi and Narasi (2013) (24.79%), Zarei et al. (2013) (75.53%) and Asghari Nekah et al. (2015) (43.70%) ($P<0.05$). In the research conducted by Talebi et al. (2015), the anxiety rate (situational and state anxiety) in children had a significant reduction using visual concept maps (22.15%) and face-to-face training (14.87%) ($P<0.001$). Furthermore, the findings of Shahrabadi et al. (2016) indicated that the anxiety rate decreased significantly in the storybook

group (70.59%) and face-to-face training group (46.87%) ($P<0.001$).

After the training program in the study by Shahrabadi et al. (2016), the level of anxiety significantly decreased (30%) in the control group ($P<0.001$). Although the level of anxiety was reported to decrease (18.08%) in the study by Zarei et al. (2013), the difference was not considered statistically significant ($P>0.05$). Similarly, in the research by Asghari Nekah et al. (2015), the level of anxiety was reported to increase insignificantly (5.26%) ($P>0.05$).

After the training intervention in the studies by Zarei et al. (2013) and Asghari Nekah et al. (2015), a significant difference was observed between the experimental and control groups ($P<0.05$), indicating the impact of education on anxiety in children. In addition, in the study by Shahrabadi et al. (2016), a significant difference was noted between the control and storybook groups ($P<0.01$), while the difference was not considered significant between the face-to-face training and control groups ($P>0.05$).

To date, only two studies have addressed the comparison of patient training methods (15, 16). For instance, in the research by Talebi et al. (2015), trait anxiety and total anxiety showed significant differences between the groups educated with visual concept mapping and face-to-face training ($P<0.05$), while situational anxiety showed no significant difference between the two groups ($P>0.05$). Moreover, no significant difference was reported in anxiety between the storybook and face-to-face training groups in the study by Shahrabadi et al. (2016).

Anxiety Due to Injection

In this section, we only discuss the investigation conducted by Hamed Tavasoli et al. (2012). In the mentioned study, play therapy training decreased anxiety in the experimental group (20.84%), and a significant increase (20%) was reported in the control group in this regard ($P<0.001$). Furthermore, a significant difference was denoted between the two groups after the intervention in terms of the anxiety level ($P<0.001$).

Anxiety Due to Dental Treatment

In this section, we only discuss the findings of Al-Namankany et al. (2015). Accordingly, use of educational videos resulted in the lower anxiety of the children in the experimental group compared to the control group in all the phases of dental treatment, with the exception of the time of arrival at the dental clinic ($P<0.01$).

Preoperative Anxiety

After the training program in the study by Sadegh Tabrizi et al. (2015), preoperative anxiety of the hospitalized children in the intervention group showed an insignificant reduction (6.95%) ($P>0.05$). On the other hand, the findings of Cumino et al. (2013) indicated a significant increase (63.2%) ($P<0.001$) in preoperative anxiety, while Li et al. (2007) reported an insignificant increment (3.18%) ($P>0.05$), and Vaezzadeh et al. (2011) reported reduced preoperative anxiety by 11.49%.

According to the findings of Fortier et al. (2015), during the three phases of evaluation, preoperative anxiety showed an insignificant reduction upon the entering of the children into the operating room

($P>0.05$), which was followed by a significant increase after applying the anesthesia mask ($P<0.05$).

After conducting the training program on the control group, the level of preoperative anxiety was reported to increase significantly in the studies by Sadegh Tabrizi et al. (2015) (6.56%), Cumino et al. (2013) (65.54%), Li et al. (2007) (15.95%), and Vaezzadeh et al. (2011) (9.52%). Similarly, the results obtained by Fortier et al. (2015) demonstrated that the preoperative anxiety level of children increased significantly upon entering the operating room and applying the anesthesia mask as compared to the time of separation from their parents ($P<0.05$).

In the studies by Li et al. (2007), Vaezzadeh et al. (2011), Majzoobi et al. (2013), Felder-Puig et al. (2003), and Fortier et al (2015), a significant difference was observed between the experimental and control groups in terms of the preoperative anxiety level after the intervention ($P<0.05$), confirming the impact of patient education on preoperative anxiety in children. However, such association was not observed in the studies by Sadegh Tabrizi et al. (2015) and Cumino et al. (2013) ($P>0.05$).

Postoperative Anxiety

According to the study by Li et al. (2007), the level of postoperative anxiety increased in the intervention group (0.84%) after surgery rather than before the intervention, whereas it reduced (2.27%) more significantly compared to the preoperative phase. In the control group, postoperative anxiety increased more significantly (8.62%) compared to before the intervention, while a decline (6.32%) was noted in the

postoperative anxiety level compared to the preoperative phase.

In the studies by Li et al. (2007) and Felder-Puig et al. (2003), the children in the intervention group showed lower postoperative anxiety levels compared to the control group ($P < 0.05$), which confirmed the positive effect of patient education on the alleviation of postoperative anxiety in children.

Discussion

The present study aimed to assess the training methods used to control anxiety in the children receiving treatment. This is the first systematic review of the educational interventions for children, in which anxiety has been evaluated in several invasive and noninvasive methods. According to the results, some of the main anxiety-causing factors in children during treatment included the hospital personnel, medical equipment, hospital environment, medical practices and procedures, being away from home, and fear of pain and death (1). Using various training approaches could diminish the effects of the mentioned parameters.

In the reviewed articles, play therapy was more commonly applied compared to other methods, playing a key role in the entertainment and training of children. Since several studies had used play therapy for this purpose, we only reviewed five studies that were more appropriate and conducted recently. As for the other approaches in this regard, especially modern methods, a larger number of studies need to be reviewed in order to obtain reliable results.

In the literature, the studies focusing on the surgery and hospitalization of children outnumbered those focusing on the anxiety

caused by injection procedures and dental treatments. As a result, more articles should be assessed in relation to the anxiety level of children in the case of these care procedures. Given the importance of the issue, Majzoobi et al. (2013) claimed that attaching intravenous catheters is one of the most common invasive procedures exposing children to stress and anxiety, especially in the case of younger patients, who perceive this procedure as the most stressful aspect of their condition, hospitalization, and even outpatient visits. Furthermore, several studies have reported a strong association between dental anxiety and avoidance of dental care (23).

With the exception of the research by Bazmi and Narasi (2013), allocation of the research units in the reviewed articles was random in all the patient groups, which indicates that the researchers did not intend to divide patients on a particular basis. In the study by Bazmi and Narasi (2013), the participants were assigned to one group via non-random (convenience) sampling. In addition, in the studies that explored demographic variables, the groups were homogeneous in terms of these variables, causing the findings to be less dependent on demographic variables.

Among the reviewed studies, only Al-Namankany et al. (2015) surveyed the blinding of the research units, which is almost impossible in most training methods. For instance, while children receive play therapy, they perceive that it is not a routine procedure in the hospital. As for the blinding of the researchers, the studies Li et al. (2007) and Vaezzadeh et al. (2011) were available only, and no discussions were provided in this regard in the other articles;

lack of this item might have added to the bias of the researchers.

The study by Majzoobi et al. (2013) was the only paper that measured physiological variables (heart rate, systolic and diastolic blood pressure) in children in addition to their anxiety levels. According to the findings, since some behavioral issues reflect physiological states and others are directly caused by physiological disorders, accurate diagnosis and proper treatment of behavioral disorders often require a thorough psychological examination (1). Therefore, considering the effects of physiological factors on anxiety could yield more accurate results in the studies with an interventional design.

In the majority of the reviewed studies, patient education programs reduced the anxiety of children during hospitalization, injections, surgery, and dental treatments (9, 11-13, 16-22). Among the 14 retrieved articles in the current review, only three cases reported that patient training methods have no effect on the reduction of anxiety in the children receiving treatment (10, 14, 15). The highest rate of anxiety reduction in hospitalized children has been reported by Zarei et al (2013). In the mentioned study, storytelling was observed to decrease anxiety up to 75.53%. Similarly, several studies have suggested that using play therapy, doll therapy, the internet, videos, and novel therapy could alleviate anxiety in children, while face-to-face training and pamphlets may not reduce their stress as effectively, which could be attributed to the lack of children's interest in face-to-face training and pamphlets compared to other

attractive techniques. In this regard, some other reasons are as follows:

1. Dolls are fascinating, and using them is entertaining and motivating to children since they believe dolls to be life-like characters.
2. The exhibition of the medical apparatus by physicians and nurses in addition to entertainment teach children how to use and work with medical equipment.
3. Storytelling is a natural means to communicating with children, whether for therapeutic purposes or other intentions (1).

Among the reviewed studies, only two papers focused on the comparison of the groups of patient education (15, 16), proposing contradictory results in this regard. Therefore, further investigation is required to compare various training methods for children since the current findings may not suffice.

Reduction of anxiety in hospitalized children largely depends on the type of treatment. At the time of discharge, anxiety is less common in children compared to the admission time. Pain relief, time-passing or elimination of some factors may decrease anxiety. In addition, immediately before a surgery or injection, anxiety is more significant than the time of admission. Exposure to the operating room, healthcare personnel, and medical equipment are likely to intensify anxiety in children.

In a review study, Nazemzadeh et al. (2012) stated that non-pharmacological methods of pain and anxiety relief could reduce the anxiety caused by painful and stressful medical procedures in the children of various age groups. Furthermore, a

systematic review conducted by Silva et al. (2016) in this regard demonstrated that play therapy approaches could effectively alleviate anxiety in children.

Conclusion

Based on the survey strategy, 14 research articles were reviewed in terms of the reduction of anxiety in hospitalized children. Heterogeneity, duration and type of interventions, condition of the patients, and the applied tools to measure anxiety render a meta-analysis impossible in this regard. According to the findings of the current review, teaching methods are relatively effective in decreasing anxiety in the children receiving treatment.

Some of the limitations of the present study were as follows: restricted access to the full texts of some articles, poor methodological quality, which limited the generalizability of the findings in the studied populations, variety of instruments to measure variables, which made it difficult to simultaneously compare the results of different studies, very young age of some children and their need for parents' help to complete questionnaires, use of unreliable instruments to measure anxiety, and failure to provide accurate measurements.

In conclusion, it is highly recommended that further investigation be conducted using high-quality methodologies in order to assess the impact of patient education on the states and behaviors of children. Moreover, since few studies compared various training methods in children, other studies may be required in this regard. Finally, it is notable that greater use of such techniques could raise the awareness of hospital personnel,

parents, and children regarding their impact on the reduction of anxiety.

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Authors' Contributions:

The authors contributed equally to the preparation of this paper.

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