



## Designing a multimodal intervention and evaluating its effectiveness in reducing children's anxiety

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### ABSTRACT

**Background and Aim:** Anxiety is one of the most common disorders in childhood and can be a reason for the growth and continuation of anxiety and other mental health problems in other stages of life. Therefore, identifying and treating anxious children is very important. The present study was carried out with the aim of designing a multifaceted intervention and evaluating its effectiveness in reducing children's anxiety. **Method:** The current research has two qualitative and quantitative parts. In the qualitative part, in order to design a multi-modal intervention, the basis of the content of the multi-modal intervention was identified and designed from the theme analysis method, and its validity was confirmed. In the quantitative phase of the research, the effectiveness of multimodal intervention in reducing children's anxiety was evaluated. The research method of this part was semi-experimental and with a pre-test, post-test, follow-up plan with a control group. The statistical population of the research included all children aged 8-12 years old with anxiety disorders who referred to counseling centers and psychological services in Rasht and their mothers. 40 children and their mothers were randomly selected as a statistical sample and divided into two experimental groups (10 girls, 10 son and their mothers) and control group (10 girls, 10 boys and their mothers) were placed. The experimental group underwent multimodal intervention treatment for 24 sessions (16 child sessions, 8 mother sessions) of 90 minutes, and the control group remained on the waiting list and did not receive any psychological intervention until the post-test. Then, a post-test was performed for both groups and a follow-up was done after 4 months. To collect data, Spence Children's Anxiety Questionnaire, short version (2018), was used. The analysis of the data in this section was done by repeated measurement variance analysis. **Results:** The results showed that there is a difference between the mean of the test and control groups in the post-test and follow-up stages of anxiety ( $P < 0.05$ ). In other words, the multimodal intervention program reduced anxiety in anxious children, and this reduction continued in the follow-up period. **Conclusion:** Based on the findings of the research, it can be concluded that the multi-faceted intervention considering the different dimensions of the child is an efficient intervention to reduce the child's anxiety.



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## Introduction

Anxiety disorders are among the most common mental health problems reported in childhood (Jewell, Wittkowski, & Pratt, 2022; Reardon, Dodd, Hill, Jesper, Lawrence, Morgan, et al., 2022). These disorders have adverse effects on the lives of these children in various psychological, social, emotional, behavioral, and educational dimensions, which make their adaptation difficult (Schwartz, Lou Barican, Yung, Zheng, and Wedel, 2019). Suffering from these disorders is associated with functional problems in children, and when functional disorders and psychiatric disorders accompany it, it can continue into adulthood (Karande, Gogtay, Bala, Sant, Thakkar, and Sholapurwala, 2018). Estimates of the prevalence of anxiety disorders in children and adolescents vary widely, but it is estimated that the lifetime prevalence of anxiety disorders in children and adolescents is around 15-20% (Zhou, Zhang, Furukawa, Cuijpers, Weisz, Yang, et al., 2019). In Iran, Hassanzadeh Aval, Mashhadi, Bigdeli, and Amin-Yazdi (2021) reported anxiety prevalence in first-grade children with at least one anxiety disorder as 26%, which indicates the high prevalence of this disorder in this group of children. Research records in the world also indicate an increasing number of children suffering from anxiety disorders (Peterson, West, Weisz, Mack, Kipke, et al., 2021; Zhou et al., 2019). Considering the destructive consequences of childhood anxiety (Jewell et al., 2022; Reardan et al., 2022; Schwartz et al., 2019) and if not treated, the possibility of its continuation into adulthood (Karande et al., 2018), effective and suitable treatment for Reducing anxiety is one of the most important concerns of therapists and activists in the field of child health.

Various treatments are used in the field of children's anxiety, the effectiveness of all these treatments has been confirmed and they have good support, such as cognitive-behavioral therapies (Bertie & Hudson, 2021; Beshkofeh, Karami, Ahame, Kalvandy, and Dasht Bozorgi, 2020), Coping Cat program (Haj Mohammadi & Haji Alizadeh, 2021; Van Starrenburg, Kuijpers, Hutschemaekers, and Engels, 2016), Fun Friends program (Van Der Mheen, Legerstee Jeroen, Dieleman Gwendolyn, Hillegers Manon et al., 2020; Haidari, Bakhtiarpour, Makvandi, Naderi, and Hafizi, 2016), therapy based on parent-child interaction (Ghasemi Aliabadi,

Amiri, and Elahi, 2020; Sabzian, Mehrabi, and Kalantari, 2018), acceptance and commitment therapy (Peterson et al., 2021; Hadian and Kazemi, 2018), mindfulness-based therapy (Crowley, Nichols, McCarthy, Greateorex, Wu, and Myers, 2017; Talebi Tadi, Mousavi Najafi, Foruzandeh Esfahani, Rasouli Jazi, & Shams, 2020), attachment-based therapy (Ghiasi Pir Zaman et al., 2021), using various game types (Aghajani, Abedi and Hosseini, 2021; Goodarzi, Moridian and Rozbahani, 2019; Momeni Gazestan et al., 2021; Paul, Das and Sahoo, 2020), narrative therapy (Yati, Wahyuni, and Israeli, 2017; Shahabizadeh & Khaja Eminian, 2018) and art therapy (Bakhtiari, Asadi, and Bayani, 2020; Mardani, Shafi Abadi, and Jafari, 2020). In the meta-analysis conducted by Amiralsadat Hafeshjani (2022), acceptance and commitment therapy (0.755), narrative therapy (0.655), attachment-based therapy (0.598), play therapy (0.575), Cognitive-behavioral therapy (0.569), parent-child interaction therapy (0.565), mindfulness (0.539) and art therapy (0.496) were identified as the most practical and effective treatments in the field of children's anxiety. However, some of these treatments always work better for some disorders or in some situations and groups. Specialists in the multimodal therapeutic approach believe that if the therapist uses combined therapeutic techniques appropriate to the client's condition and problem, he can achieve better results. In multimodal therapy, based on his skills, the therapist identifies the treatments that he is proficient in as treatments whose techniques can be combined into an integrated method. In other words, it considers the different aspects of the client's life and selects and uses the most effective techniques for each intervention (Bello et al. 2017). Developing such interventions can play an effective role in reducing the problems of anxious children. An integrated and multifaceted therapy can use more efficient techniques and plan a more successful treatment (Milfaiti, Fadli, Ifdil, Zola, Amalianita, Putri, and Ardi, 2020). A research study shows that multifaceted interventions in the field of child anxiety have not been carried out so far, so developing such interventions is essential for treating anxious children. In this regard, the current research was carried out to design a multimodal intervention and evaluate its effectiveness in reducing children's anxiety.

## Method

The current research was carried out in two parts, qualitative and quantitative. The research method was carried out in the qualitative part of the design of the intervention program using the theme analysis method. The statistical population includes all the studies conducted in the field of the effectiveness of cognitive-behavioral therapies, parent-child interaction therapy, acceptance and commitment, attachment-based therapy, mindfulness, play therapy, art therapy and story therapy on child anxiety in the period of 2008 to 2022 that it was possible to access their full text using the keywords of cognitive-behavioral therapy, parent-child interaction therapy, acceptance and commitment, attachment-based therapy, mindfulness, play therapy, art therapy, story therapy, child anxiety in scientific databases in Iran like SID, Magiran, Ensani. Seventy-eight studies were found, and considering the criteria of rejecting and accepting articles for use in the analysis and having the most information in the field of treatment techniques used in the research, 25 studies were selected and subjected to theme analysis. The tool used in the qualitative part was the forms related to propositions and themes, which first selected the articles that met the criteria for entering the theme analysis. Then, a form was prepared in which the article's title, the author, the analyzed text, and the initial propositions were identified separately. Next, another form was prepared, which included initial propositions, a basic theme, first organizing theme, second organizing theme, and comprehensive theme. In addition, a form was designed and used by the researcher to receive experts' opinions on the content of the intervention.

In the quantitative part, which was designed to investigate the effectiveness of the multimodal intervention package, the research method was semi-experimental (pre-test, post-test, follow-up, and control group design). The statistical population of the research included all children aged 8-12 years with anxiety disorders who were referred to psychological counseling and service centers in Rasht city in 2019. Five centers were selected from counseling centers and psychological services in Rasht city. In these centers, a call to participate in the research was given while introducing the researcher (child therapist) and the research program. Among the

mothers who were willing to participate in the research (82 mothers and their children), there were 40 children with anxiety disorders scored higher in the short version of the Spence Children's Anxiety Questionnaire (2018) (cutoff point: 24/5). Their mothers were randomly selected and placed in two groups of 20 people (10 girls, 10 boys and their mothers). The experimental group underwent multimodal intervention treatment for 24 sessions (16 child sessions, 8 mother sessions) of 90 minutes, and the control group remained on the waiting list and did not receive any psychological intervention until the post-test. Then, a post-test was performed for both groups and a follow-up was done after 4 months.

## Tools

**1. Developed Spence Children's Anxiety Scale – Short Version (SCAS-S):** This scale was designed by Ahlen et al. (2018) by developing an abbreviated version of the Spence Children's Anxiety Scale of the child form while maintaining the content, convergent and divergent validity of the original scale. This study's abbreviated version of the Spence children's anxiety scale contained 19 items that measure separation anxiety, social anxiety, panic-market phobia, specific phobia, and general anxiety. Based on a four-point Likert scale, it is scored from never = 0, sometimes = 1, often = 2, always = 3. In Ahlen et al.'s research (2018), Cronbach's alpha coefficients for the entire questionnaire were 0.89 and for separation anxiety 0.62, social anxiety 0.70, panic-market phobia 0.78, specific phobia 0.65 and general anxiety 0.76. was achieved In Iran, this questionnaire was validated by Amiralsadat Hefeshjani and colleagues (1400). The factor analysis results showed that this scale has five components, panic market phobia, generalized anxiety, specific phobia, social anxiety, and separation anxiety with favorable fit indices. Cronbach's alpha values for the whole scale were 0.939 and 0.812, general anxiety 0.894, specific phobia 0.803, social anxiety 0.709 and separation anxiety 0.801, respectively. The most appropriate cut-off point of the scale was calculated as 24.5.

**2. Thematic analysis:** in the qualitative part, first, the theoretical foundations of anxiety and effective treatments were studied using the meta-analysis results of Amiralsadat Hafshejani et al. (2022) in the field of effective treatments for

child anxiety, effective treatments were identified. These treatments were: cognitive-behavioral, parent-child interaction therapy, acceptance and commitment, attachment-based therapy, mindfulness, play therapy, art therapy, and narrative therapy. Thematic analysis was used to produce more comprehensive content by studying the theoretical foundations and the intended treatments. For this purpose, the articles that were conducted on the effectiveness of each of the mentioned treatments on child anxiety between 2008 and 2022 were reviewed. The criteria for accepting and rejecting the research for use in analyzing the themes of the articles were: 1. The research is a non-pharmacological therapeutic intervention on children's anxiety, 2. An experimental or semi-experimental method was used in the research, 3. Therapeutic intervention is one of the cognitive therapies. - Behavioural, parent-child interaction therapy, acceptance and commitment, attachment-based therapy, mindfulness, play therapy, art therapy, and story therapy, 4. The therapeutic intervention has been done on a group of elementary school-age children, 5. The statistical population does not contain children with special needs, 6. Treatments whose treatment sessions are in accordance with the theoretical foundations and known therapeutic principles, and 7. Studies mention the techniques used in the treatment and intervention sessions. After selecting the desired articles to analyze the themes, the process of thematic analysis included: collecting and familiarizing the data through study and implementation, categorization and coding, searching to find the themes, and reviewing the themes with the intention of refinement, defining and naming themes (conceptualization), analysis, interpretation and conclusion, visual presentation of themes and finally preparing a report. From the analysis of these articles, 324 primary propositions were obtained, and 324 basic themes were obtained from these primary propositions. Of course, some themes were similar due to the similarity of treatment approaches, which confirms the themes obtained from that approach. By categorizing the basic themes, 65 organizing themes were obtained, which are as follows:

1) anxiety and its characteristics, 2) types of anxiety disorders, 3) axes of anxiety, 4) and physiological reactions, 5) and cognitive-behavioral reactions, 6) attention to the cognitive

and behavioral dimensions of anxiety, 7) discovering cognitive distortions and their correction, 8) Training in adaptive methods, 9) Effectiveness of the cat coping program in the treatment of anxiety disorders, 10) Relaxation training, 11) Confrontation, 12) Identification of feelings and physical reactions, 13) Correction of incompatible and anxious thoughts, 14) Problem solving training, 15) self-evaluation and rewarding, 16) the effectiveness of the "Friends" program in anxiety, 17) Friends intervention sessions (including: getting to know emotions, regular de-stressing, identifying positive and negative thoughts, problem solving skills, rewarding successes), practice learned skills and joyful program), 18) basics of play therapy, 19) reasons for using games for therapy, 20) basics of non-directive play therapy approach, 21) paying attention to the child's wishes and interests (in non-directive play therapy), 22) expressing problems and acquiring Insight through play, 23) The basics of narrative therapy, 24) The benefits of narrative therapy, 25) The emotional word game fan, 26) The button box fan, 27) The guess my story fan, 28) The fan storytelling with objects, 29) the technique of using metaphor, 30) the benefits of parent-child play therapy, 31) the definition of separation anxiety, 32) the characteristics of an anxious child's parent, 33) the basics of parent-child interaction therapy, 34) modifying parents' behavior in interaction with child, 35) creating changes in the primary context, 36) increasing warm and responsive behaviors, 37) making parents aware of separation anxiety, 38) the effect of attachment on separation anxiety, 39) the effect of mother's behavior on anxious behaviors, 40) sensitivity to the child's signs and appropriate response, 41) characteristics of secure attachment, 42) the effect of mental representation on attachment, 43) other attachment-oriented training for mothers (such as getting to know the types of attachment, paying attention to exploratory and attachment behaviors, training to express emotions, recognizing basic needs separation anxiety), 44) Benefits of mindfulness (seeing clearly and accepting, paying attention to sensory experiences), 45) Basics of mindfulness, 46) Mindfulness training through breathing, 47) Body inspection, 48) Calm body training, 49) Mindfulness training through senses, 50) meditation training, 51) paying attention to thoughts, emotions and mood, 52) social anxiety

(fear of social situations and avoiding social situations), 53) characteristics of acceptance and commitment therapy, 54) the concept of acceptance, 55) the concept of commitment, 56) the goal of acceptance and commitment therapy, 57) connection with individual experience (mindfulness), 58) fault, 59) self as context, 60) attention to values, 61) Mindful action, 62) Metaphors, 63) Art: a means to understand emotions and conflicts, 64) Benefits of drawing therapy, 65) Reducing anxiety and resolving conflicts through art.

### Results

In this research, 40 anxious children referring to the psychological service centers of Rasht city were examined in two groups of 20 people, including the multimodal intervention program and the evidence. The average age of the children in the multimodal intervention program group was  $9.96 \pm 0.978$  years and the average age in the multimodal intervention program group was  $10.12 \pm 1.01$  years. In both groups, 10 children were girls and 10 were boys.

According to the findings, the average scores of children's anxiety variables in the multimodal intervention program group have changed in the post-test stage compared to the pre-test stage. These changes confirm that in the multimodal intervention program group, the participants' post-test scores in the children's anxiety variable have decreased. Moreover, in the follow-up period, the results indicated that the scores of the variables did not change significantly compared to the post-test stage. In this test, obtaining lower scores in children's anxiety shows the improvement of anxiety and tension in anxious children. Repeated measurement variance analysis was used to check the research hypotheses. In this study, there was a within-subject factor, which was the time of measuring the research variables in the pre-test, post-test, and follow-up stages. There was a between-subject factor, which was group membership (experimental and control groups). Therefore, the design used is the within-between subject design (Pallant, 2020).

According to the findings, the average difference of the multimodal intervention program group with evidence in the pre-test stage in anxiety (0.050), separation anxiety (-0.100), social anxiety (-0.200), panic (150. 0), specific phobia (0.200) and pervasive anxiety (0.00) is not significant ( $P > 0.05$ ). This finding shows no

significant difference between the two groups of the multimodal intervention program and the control in the pre-test stage, and the groups are homogeneous. The average difference of the multimodal intervention program group with evidence in the post-test stage in anxiety (-19.550), separation anxiety (-4.250), social anxiety (-4.150), panic (-2), specific phobia (-3.200) and pervasive anxiety (-5.950) is significant at 0.05 level. This finding shows that in terms of anxiety and its dimensions, the average of the multimodal intervention program group in the post-test phase is significantly lower than the average of the control group. The average difference of the multimodal intervention program group with evidence in the follow-up phase in anxiety (-20.100), separation anxiety (-4.30), social anxiety (-4.100), panic (-2.350), specific phobia (-3.350) and generalized anxiety (-6) are significant at the level of 0.05. This finding shows that in terms of anxiety and its dimensions, the average of the multimodal intervention program group in the follow-up phase is significantly lower than the average of the control group. According to this finding, it can be said that there is a significant difference between the improvement of anxious children's anxiety in the experimental and control groups after the multimodal intervention program, and the multimodal intervention is effective in improving anxiety and its dimensions in anxious children.

### Conclusion

The present study aimed to design a multimodal intervention program for anxious children. The results showed that all the components obtained in this analysis were based on effective and widely used therapeutic techniques in treating children's anxiety. In the common concepts in several treatments, the technique was chosen from the more attractive treatment to children. Due to the variety of methods to implement the techniques, the therapist can create a more attractive environment for children, which increases the intervention's probability of success. The themes obtained include both child-centered interventions, parent-centered interventions, and child-parent programs, which increase the power of the intervention to reduce the child's behavioral problems. In the designed sessions, using the anxiety game and anxiety-causing situations were introduced to the children. In the form of a game, children became

familiar with their own anxiety situations and other anxiety-provoking situations that other children had experienced. They got to know the types of anxiety and its symptoms, which plays a significant role in children's emotional awareness and subsequent emotional management in children. In the following, with the emotional awareness obtained, children found the ability to talk about their concerns with the help of drawings and stories and became aware of anxiety-provoking situations. By providing assignments in this field, he strengthened these skills in children. Children are familiar with the physical, psychological and emotional reactions of anxiety, and with the help of techniques such as diaphragmatic breathing, conscious mind breathing and games related to calmness, such as little turtle and ice and sun, they can reduce and manage the symptoms of anxiety. Kodal et al., 2018).

In order to teach self-talk to children, narrative therapy was used, and the distinction between anxious and adaptive self-talk was used in this intervention through playing with dolls. Games and paintings based on mindfulness were done in this intervention to help children live in the present. Another part was feared in children, which were included in this intervention utilizing behavioral techniques of cognitive behavioral therapy to reduce fear. The confrontation technique and hierarchy of fear in this intervention helped children to reduce their fears. This intervention empowers children to recognize their emotions and accept things that cause much anxiety, using the techniques of creating acceptance and mindfulness by letting go of trying to control, using metaphors, and creating a cognitive fault using painting. In this intervention, with the aid of acceptance and commitment therapy techniques, the child was helped to identify his values, and to make the techniques more attractive, a drawing of values was used. In the designed exercises, stories were told so that children could guess the protagonist's values. With the help of the techniques of this therapy, children set goals for their lives and consider themselves responsible for them, and this part of the intervention helps children to know the values of their lives and to plan for them to lead a meaningful life for them. They bring along. When life is predictable, it creates a sense of control in a person, which can reduce anxiety (Bertie & Hudson, 2021).

In other words, it can be said that this intervention considers the following matters: individual issues and causes that can cause anxiety in the child; the use of child-centered techniques; communication factors, including communication with the parent in the event of anxiety; the use of parent-centered techniques. These techniques provided more tools for the child to be more successful in managing his anxiety. The techniques used in the multifaceted intervention of the child-centered department in a space suitable for the child and through games, stories, dramas, and drawings were able to affect different aspects of the child, including cognition, excitement, emotion, mental images, behavior, and interpersonal relationships. In other words, in this intervention, children learned different skills that helped them have several tools in their coping bag to act more efficiently in different situations and at different levels of anxiety. In sum, multifaceted intervention techniques improved their interactions by empowering children and their mothers and helped children have multiple tools in their coping baggage to be more efficient in different situations and at different anxiety levels (Peterson et al., 2021).

#### Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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