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The Effectiveness of Mandala Art Therapy on the Anxiety of Mothers of Children with Epilepsy

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ABSTRACT

Objective: This study aimed to evaluate the effectiveness of mandala therapy in reducing anxiety among mothers of children with epilepsy.

Methods: A quasi-experimental study with a pre-test/post-test design and a control group was conducted. The statistical population included mothers of children with epilepsy in Bonab city. Thirty mothers were selected through convenience sampling from special needs schools and randomly assigned to either an experimental group (n=15) or a control group (n=15). Anxiety levels were assessed using Zung's Self-Rating Anxiety Scale. The experimental group participated in eight 50-minute mandala therapy sessions, while the control group received no intervention.

Results: Analysis of covariance showed that the mean anxiety scores of the experimental group were significantly lower than those of the control group after the intervention, indicating that mandala therapy had a significant effect on reducing anxiety.

Conclusions: Mandala therapy appears to be an effective non-pharmacological intervention for reducing anxiety in mothers of children with epilepsy. These findings suggest that it may be a useful supportive approach for this population.

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Introduction

Epilepsy is one of the most common neurological disorders globally, affecting approximately 35 million individuals. This chronic condition is characterized by recurrent seizures stemming from sudden electrical discharges in the brain's neurons (Umer et al., 2020). The implications of epilepsy extend beyond the individual, significantly impacting family dynamics and the well-being of caregivers. Often, a diagnosis of a chronic illness during childhood induces crisis situations within families, as parents grapple with feelings of responsibility for their child's health, resulting in increased anxiety, guilt, and despair. Consequently, the overall functioning of both parents and family members may suffer considerably (Beghi, 2020).

The emotional toll on parents, particularly mothers, of children with epilepsy can be profound. They frequently contend with feelings of guilt, isolation, and negative self-perception. These feelings are often compounded by anxieties regarding their children's uncertain futures and the added stress of managing a chronic condition. Research indicates that the responsibilities of caring for a child with epilepsy can lead to elevated levels of anxiety and depression (Milligan, 2021). For these parents, navigating daily life amidst these challenges can result in significant emotional distress.

Literature highlights that anxiety is a common issue among parents of children facing health challenges, including epilepsy (Belza et al., 2023). This anxiety manifests in symptoms ranging from pervasive worry and fear to physical manifestations such as headaches and fatigue. Notably, these symptoms can lead to a diminished sense of agency and overall well-being, affecting both personal and familial dynamics (Rask et al., 2024). The intricate interplay of emotional burdens amongst family members emphasizes the need for targeted support mechanisms for these parents. Typically, the closest caregivers to children with epilepsy are their mothers, who often bear the primary responsibility for care. Studies show that mothers of children with disabilities experience substantially higher levels of anxiety compared to those of typically developing children (Aguilera et al., 2021). Moreover, research indicates that these parents exhibit lower levels of resilience and social integration, which heightens their vulnerability and underscores the urgent need for effective interventions (Aydin et al., 2021). Hence, supporting parents of children with epilepsy should encompass more than conventional treatments; it should also include enhancing their

understanding of their circumstances and fostering a sense of meaningfulness in their lives (Fortin-Bédard et al., 2023).

The increasing recognition of mental health care's importance in non-pharmacological interventions underscores a significant shift towards holistic approaches that address both emotional and psychological wellbeing. Art therapy has gained prominence as a viable option, offering enhanced emotional, social, and psychological functioning for individuals facing various challenges. This therapeutic approach can facilitate adaptation and promote personal efficacy, thus improving overall quality of life (Sajnani & Johnson, 2024). Various art-based therapies, such as theater, music, storytelling, and movement, are increasingly employed in therapeutic contexts, serving either as a complement to or an alternative for pharmacological treatments (Van Den Broek, Keulen-de Vos, & Bernstein, 2011).

Among these methods, mandala therapy has emerged as a notable intervention. In many Eastern cultures, mandalas symbolize meditation and spiritual enlightenment. Jung proposed that mandalas represent the integration of consciousness and the unconscious, reflecting psychological wholeness and balance (Jung, 2012). The term "mandala" is derived from Sanskrit, meaning "circle" or "disk," and it represents the universe in both Buddhist and Hindu traditions (Zhang, Liu & Huang, 2024). Throughout history, mandalas have appeared in various cultures, embodying deep religious and ethnic significance (Li et al., 2024). Jung argued that mandalas serve as pathways to personal self-awareness, offering valuable insights into an individual's internal mental landscape (Lee, Kim & Choi, 2023).

Mandala therapy has gained recognition as an effective program within psychiatric settings and is particularly beneficial for individuals seeking to navigate the integration of reality and imagination. According to Jung, engaging in the creation of mandalas through coloring or drawing allows individuals to tap into their imagination, which fosters individual expression and self-reflection (Jung, 2012). Recent studies indicate that mandala imagery can effectively alleviate anxiety symptoms, with specific programs in cancer care centers recommending mandala art therapy to promote relaxation among survivors facing psychological distress (Akbulak & Can, 2023).

Despite the extensive body of research demonstrating the efficacy of art therapy in reducing anxiety, a notable gap persists in studies specifically addressing the impact of mandala therapy,

particularly regarding its application for parents of children with epilepsy. While a growing body of literature supports the use of various art-based interventions, including general art therapy, in alleviating psychological distress, the specific therapeutic mechanisms and outcomes associated with mandala art therapy remain underexplored within the context of caregivers for children with epilepsy. Existing research often focuses on different populations or employs broader art therapy techniques, leaving a significant void in understanding how the unique properties of mandala creation—it's symbolic representation of wholeness, its meditative qualities, and its capacity to foster focused attention—can directly benefit mothers navigating the complex emotional landscape of raising a child with epilepsy. This unmet need highlights the critical importance of this study, which aims to fill this specific research gap by providing robust empirical evidence on the effectiveness of a structured mandala art therapy program in significantly reducing anxiety levels among mothers of children with epilepsy. The novelty of this research lies in its targeted approach, directly addressing the specific stressors and anxieties faced by this particular population. By offering a cost-effective, accessible, and non-pharmacological intervention, this study seeks to provide a practical and empowering solution to the profound interpersonal and intrapersonal effects of chronic stress and anxiety that can strain family dynamics and diminish the overall quality of life for these mothers. Ultimately, this research endeavors to demonstrate that mandala art therapy can serve as a valuable tool in mitigating these challenges, fostering greater emotional resilience, and enhancing the well-being of both mothers and their families."

Material and Methods

The present study utilized a semi-experimental design, featuring a pre-test and post-test approach with a control group. The research population comprised mothers of children with epilepsy attending special needs schools in Bonab city during the year 1403. Initially, children's files were reviewed to identify those with epilepsy. Subsequently, 30 mothers were selected through a non-random sampling method (available sampling). The inclusion criteria for participants were: 1) a confirmed diagnosis of epilepsy in the child, and 2) ongoing management of the condition with continuous anticonvulsant and epilepsy medications. Ethical considerations were rigorously upheld throughout the study. The anonymity of both patients and their medical records was maintained, and participants were informed of their right to decline participation or withdraw from

the study at any time without consequence. Additionally, participants were fully informed about the nature of the study and provided their consent to participate in the research. Information was gathered utilizing the questionnaire.

Zanke Anxiety Scale: This scale, originally developed by Zung (1971), is a 20-item self-report questionnaire used to measure the severity of anxiety symptoms in adults. The items are scored on a four-point frequency Likert scale ranging from "Never" to "Almost Always." The scale is structured such that 15 items assess somatic-physiological symptoms (such as heart palpitation and tremors), while the remaining 5 items evaluate emotional-cognitive symptoms (such as fear and panic) (Zung, 1971). Among the advantages of this scale are its brevity, ease of administration, and the difficulty for respondents to provide directional answers (bias) due to the inclusion of both positive and negative items. The raw score ranges from 20 to 80 and is converted into a standardized score using the Zung Anxiety Index formula (raw score divided by 80 multiplied by 100).

In his original study, Zung (1971) confirmed the discriminant validity of the scale, reporting that it significantly differentiated patients diagnosed with anxiety disorders from the normal control group. Acceptable internal consistency (reliability) was also reported for the scale. Furthermore, this scale has been validated and standardized by various researchers in Iran. In a foundational study by Beshart, Gholamali Lavasani, and Atef Vahid (2012 [1391 in Persian calendar]), the Zung Anxiety Scale was extensively standardized on Iranian samples. In this research, the Cronbach's alpha coefficient for the total scale was found to be 0.85, indicating satisfactory reliability of the instrument. To examine convergent validity, the correlation between this scale and the Beck Anxiety Inventory (BAI) was calculated, yielding a significant correlation coefficient of 0.72, suggesting adequate convergent validity. Moreover, Exploratory Factor Analysis confirmed a two-factor structure (cognitive-emotional symptoms and physical symptoms) for this scale within the Iranian population.

Procedure

After randomly assigning participants to the experimental and control groups, a pre-test was administered to both groups. Subsequently, the experimental group received mandala art therapy training, consisting of eight sessions, each lasting 60 minutes, once a week. To ensure timely attendance, all sessions were scheduled in advance with the participants. After the completion of

the eight-week intervention, a post-test was administered to both groups. The intervention sessions were based on programs developed by Labadi and Ronaghi (2008) and Khamesan, Rajabpour, and Radmehr (2005), which focused on coloring various mandala designs. During each session, ten mandala designs were provided to participants in printed form. The participants were instructed to focus on their coloring while simultaneously writing down any negative thoughts that came to mind during the activity on a separate sheet of paper. At the end of each session, participants reflected on their negative thoughts and inner dialogues. In the final three sessions, they were encouraged to replace their negative thoughts with positive ones while continuing to color. These changes in mindset were noticeable in the participants' speech, as they began to describe themselves and their lives using more positive language. The content of the therapy sessions is summarized in Table 1.

The Zank Anxiety Scale was administered in a quiet and undisturbed room at the session venue, which was the special needs school in Bonab. Participants were assured that their responses would remain confidential. The questionnaire took approximately 15 to 20 minutes to complete. The sessions were held in special needs schools in Bonab, chosen because of the mothers' familiarity and ease of access. The sessions were conducted by the researcher, who had experience working with children with special needs and their parents. Data collection (administering the pre-test and post-test) took two months. The participants were given explanations about the program. They were also assured that the results of the study would be shared with them if they wished. The participants were thanked and appreciated at the end of each session.

The intervention program used in this study was a structured mandala art therapy protocol adapted from two seminal and validated studies in the field: the work of Curry and Kasser (2005), who developed and validated a standardized protocol for using mandala coloring to reduce anxiety, and the program outlined by Babakhani (2017), which specifically applied and documented the efficacy of mandala art therapy within an Iranian cultural context. The primary framework was derived from the experimentally validated protocol of Curry and Kasser (2005), known for its structured approach to inducing a meditative state through mandala coloring. This framework was then culturally and contextually tailored for the present target population (mothers of children with epilepsy) based on the methodological adaptations described by Babakhani (2017). The validity and therapeutic integrity of the final integrated protocol were confirmed through a comprehensive

review of authoritative scientific sources and its established successful application in previous peer-reviewed research that has demonstrated significant outcomes in anxiety reduction (Babakhani, 2017; Curry & Kasser, 2005).

The sessions were conducted by the principal researcher, who holds a Ph.D. in Counseling and has completed specialized training courses in art therapy techniques, including mandala therapy, under the supervision of licensed clinical psychologists. Adherence to the treatment protocol (Treatment Fidelity) and ensuring its correct implementation were ascertained through the following methods: 1) Session Fidelity Checks: The researcher adhered to a detailed session-by-session manual outlining the objectives, activities, and timing for each session. 2) Assessment of Participant Compliance: Objective participant compliance was assessed through attendance records and the systematic collection and review of completed mandala artworks and notes on negative thoughts assigned as homework. 3) Process Monitoring: The researcher actively monitored the participants' level of engagement and provided standardized, protocol-congruent guidance throughout the sessions to maintain treatment fidelity.

Table 1. Summary of the content of mandala art therapy sessions Curry & Kasser (2005)

session	Target	brief description	homework
1	Initial acquaintance and communication	Introducing the therapist, explaining the goals, introducing the mandala, art therapy, group rules	Looking inside, strengths and weaknesses
2	Conducting the pre-test	A description of how to respond to the scale	Full attention to the items requested from the members
3	Presentation of mandala designs	Providing designs with coloring tools to members	The designs were done with a pencil sketch along with negative internal discourse
4	Complexity of designs	Plans are changed, anxiety can be seen in all the participants and it has become a part of their lives.	Plans continue and people share experiences.
5	Pencil etudes and negative internal discourse	In the pencil drawings, the internal discourse is more negative.	It has been tried to reduce negative thoughts and replace them with positive thoughts.
6	Using colored pencils	A new look at positive points and abilities, self-definition, friendship and self-compassion	Positive thoughts have replaced negative thoughts. People have learned to be kind to them.
7	The world of color and self-compassion	Preparing to finish the program	Until the next session, I complete my inner mandala with the best colors of life.
8	Intra- and post-test mandala	The last mandala is drawn and people write their words on the back of the mandala.	Positive thoughts and sentences are permanent.

Ethical Considerations: This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Prior to the commencement of the research, the study's

objectives, procedures, and potential benefits were fully and clearly explained to all participants in simple language. Participants were assured that their participation was entirely voluntary and that they had the right to withdraw from the study at any stage without providing any reason and without any consequences. Written informed consent was obtained from all individuals involved in the study. Furthermore, the confidentiality of participants' data and identities was strictly maintained throughout the research process, data analysis, and the publication of the findings.

Results

The age of all participants in this study, encompassing both the experimental and control groups, ranged from 25 to 40 years. In terms of educational attainment, 60% of participants held a bachelor's degree, 30% had a diploma, and 10% possessed a postgraduate degree. The descriptive data related to anxiety levels is presented in Table 2.

Table 2. Average and standard deviation of pre-test and post-test by test groups

Group	Test type	Number of members	M	SD
Experiment	Pre-test	15	2.26	0.295
	Post-test	15	1.70	0.297
Control	Pre-test	15	2.09	0.307
	Post-test	15	1.91	0.359

To investigate the effectiveness of the therapeutic intervention on anxiety, a univariate analysis of covariance (ANCOVA) was employed. One key assumption of this analysis is the normality of data distribution. The results of the Kolmogorov-Smirnov test indicated that the data met the normality condition for both the pre-test ($P < 0.05$) and post-test ($P < 0.05$).

Another important assumption is the equality of error variances, which was confirmed by Levene's test, yielding results that supported this assumption ($P < 0.05$). Consequently, a univariate analysis of covariance was conducted, and the results are presented in Table 3.

Table 3. ANCOVA results to investigate the effectiveness of the therapeutic intervention based on mandala art therapy on reducing anxiety

Source of changes	SS	DF	MS	F	P	Eta squared
Pre-test	0.483	1	0.483	4.992	0.035	0.156
Group	0.705	1	0.705	7.299	0.013	0.212
Error	2.618	27	0.096			
Total	102.075	30	-			

As indicated in the table above, after controlling for the pre-test scores, there is a significant difference between the average scores of the two groups. This suggests that mandala therapy has been effective in reducing anxiety among mothers of children with epilepsy.

Discussion

The purpose of this study was to investigate the effectiveness of mandala therapy in reducing anxiety among mothers of children with epilepsy. The results indicated a significant decrease in anxiety levels among mothers who participated in the art therapy intervention program featuring mandala designs. This finding aligns with previous research, including Campenni & Hartman (2020), which demonstrated the effectiveness of mandala designs in reducing anxiety and negative emotions; Soape et al. (2021), who reported reduced anxiety in delinquent girls; and Suleman et al. (2022), who found similar results in a study of 195 hospitalized individuals.

To provide a more comprehensive explanation, it is important to consider the underlying mechanisms by which mandala therapy impacts anxiety. A primary characteristic of anxiety disorders is excessive worry and fear, which often encompass various everyday concerns that shift over time (Altweck et al., 2017). For individuals experiencing anxiety, managing work-related stress can be particularly challenging, potentially leading to decreased social and occupational performance (Wong et al., 2024.(

From a neurobiological perspective, anxiety is associated with hyperactivity in the amygdala and reduced activity in the prefrontal cortex (PFC) (Shin et al., 2005). The amygdala is responsible for processing emotions, especially fear, while the PFC is involved in regulating emotions and cognitive functions. Mandala therapy may modulate these brain regions through the process of focused attention and repetitive actions involved in coloring and drawing. Specifically, engaging in art activities can promote the release of dopamine, a neurotransmitter associated with pleasure and reward, which can help counterbalance the negative emotions associated with anxiety (Abbing et al., 2019)

According to Jung’s theory regarding the relationship between mandala design and its archetype, the concentric circular shapes inherent in mandala designs enhance individuals’ ability to control both conscious and unconscious forces while drawing or coloring. This process allows for the release of unconscious tensions, aiding in anxiety management (Jung, 2012). Wang et al. (2024)

propose that the complexity of mandala shapes and the act of coloring induce a meditative state, facilitating the overcoming of anxiety. This meditative state can be further understood through the concept of "flow," a state of deep immersion and enjoyment in an activity, which has been shown to reduce anxiety and enhance well-being (Lynch & Troy, 2021).

Archetypal psychology emphasizes the importance of being attuned to the surrounding world and its various dimensions to achieve mental health. In Jung's framework, the mandala serves as a tool for fostering this awareness, promoting greater mental health through enhanced insight, self-awareness, and a deeper understanding of one's identity (Potash, Jen, & Tseng, 2016). Additionally, the act of creating and completing a mandala can provide a sense of accomplishment and control, which may be particularly beneficial for mothers of children with epilepsy, who often experience feelings of helplessness and uncertainty (Kırca & Dağlı, 2024).

The findings of this study suggest that art therapy utilizing mandala designs can serve as an effective non-pharmacological treatment for anxiety disorders, particularly among mothers of children with special needs. This holds significant implications for mental health practitioners, educators, and caregivers working with similar populations, as integrating art therapy into therapeutic practices could offer valuable support in managing anxiety. Furthermore, expanding the application of mandala therapy to include family members of children with epilepsy may enhance relational dynamics and foster a shared coping strategy, ultimately benefiting the entire family system.

Moreover, future research should explore the potential of mandala therapy as a complementary treatment alongside pharmacological intervention. Combining art therapy with conventional treatments may lead to synergistic effects, enhancing the overall effectiveness of anxiety management (Speckens et al., 2007). Additionally, longitudinal studies are needed to assess the long-term impact of mandala therapy on anxiety levels and overall well-being.

In conclusion, this study provides evidence for the effectiveness of mandala therapy in reducing anxiety among mothers of children with epilepsy. By integrating theoretical explanations and considering neurobiological mechanisms, this discussion offers a more comprehensive understanding of how mandala therapy can be a valuable tool in promoting mental health and well-being.

However, the study's limitations include a small sample size and the specificity of the population—mothers of children with epilepsy attending special needs schools. Caution should be exercised when generalizing the results to broader populations. Future research should explore the effects of this intervention on additional variables, such as impulse control, aggression, depression, self-efficacy, self-expression, and the improvement of interpersonal relationships. Investigating the long-term effects of mandala therapy and its applicability across different demographics could also enrich the existing body of literature on art therapy.

Additionally, qualitative research approaches could be incorporated in future studies to obtain deeper insights into participants' experiences and the subjective impact of mandala therapy on their mental well-being. By capturing personal narratives and emotional responses, researchers could better understand the underlying mechanisms through which mandala therapy facilitates anxiety reduction. Such qualitative data could complement quantitative findings, providing a holistic perspective on the effectiveness of this therapeutic intervention.

Overall, this study emphasizes the importance of exploring innovative, non-pharmacological approaches to mental health treatment, especially for vulnerable groups. By enhancing our understanding of therapeutic interventions like mandala therapy, we can better support mental well-being in various populations, ultimately contributing to improved health outcomes.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Farhangian University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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