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Featured Article

The effect of art-based mandala intervention on death anxiety and anger levels in elderly adults living in nursing homes: A randomized controlled study

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ABSTRACT

Objective: This study aimed to investigate the effect of art-based mandala intervention on anger and death anxiety in older adults residing in a nursing home.

Methods: A randomized controlled experimental study with 80 participants (experimental group $n = 40$; control group $n = 40$) was conducted. The experimental group participated in mandala coloring three times a week for 12 weeks. Data were collected using a descriptive form, a death anxiety scale, and the State-Trait Anger Expression Inventory.

Results: Post-mandala, the experimental group showed significantly lower anger scores compared to the control group ($p = 0.001$). Statistically significant differences were found in State Anger, Anger-In, Anger-Out, and Anger Control ($p < 0.01$). A significant decrease in death anxiety scores was observed in the experimental group ($p < 0.01$). Anger levels explained 42.4% of the variance in death anxiety ($p = 0.001$).

Conclusion: Mandala coloring is an effective intervention for reducing anger and death anxiety in elderly nursing home residents.

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Introduction

Aging is known as a period in which individuals experience physical decline, increased losses, dependence on their environment, and more mental health issues, and the number of older individuals worldwide is steadily increasing.¹ The global proportion of older adults was reported as 8.2 % in 2015, rising to 9.3 % in 2020, and is projected to reach 25.6 % by 2080.² With advancing age, anxieties

about the future, fear of death, feelings of insecurity, a sense of rejection by family, friends, and society, and the limitations imposed by old age can lead to feelings of frustration and anger in older individuals.³

The shift towards nuclear family structures has led to an increase in the number of older adults residing in nursing homes.⁴ Traditionally, older individuals held a respected position within the family unit. Relocating to a nursing home, thus losing their established social status and familiar home environment, is often a difficult transition for older adults.⁴ As a group at higher risk for mental health challenges, older adults in nursing homes experience significant difficulties, and a lack of social support has even been linked to increased mortality risk.⁵ The decline in productivity and functionality associated with aging can contribute to physical and mental health problems, triggering feelings of death anxiety and anger.^{6,7}

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Nursing, a care discipline responsible for individuals from birth to death, plays a crucial role in the healthcare team, particularly in the care of older adults. Nurses conduct holistic assessments, facilitate communication skills and independent living skills required for daily life, and play a significant role in providing preventative services.⁸ For nurses working in geriatric care, identifying at-risk individuals, planning, implementing, and evaluating preventative interventions is essential for improving the quality of care, promoting mental well-being, and enhancing the quality of life for older adults.^{6–9}

Mandala art therapy is a therapeutic approach that allows individuals to externalize complex and abstract thoughts resulting from painful experiences through artistic expression.^{7,9} Mandala, typically circular in form, is both an art therapy method and a meditation tool that provides a structured space for individuals to express their emotions and thoughts. Art-based mandala interventions are employed to help individuals manage and regulate a range of negative emotions, including anger, anxiety, stress, death anxiety, and depression.^{6,7,10} Older adults accumulate numerous physical and emotional experiences throughout their lives, which can have both positive and negative impacts. With aging, existential concerns and psychological vulnerabilities increase, negatively affecting quality of life. In this context, death anxiety is a common phenomenon among older adults and can significantly influence psychological, social, and physical well-being.³ High levels of death anxiety can heighten stress, depression, and feelings of loneliness, ultimately reducing life satisfaction. Art therapy applications can serve as a supportive tool in helping older individuals cope with such psychological challenges. Mandala art therapy offers individuals the opportunity to explore their inner worlds, make sense of their emotions, and experience psychological relief through creative processes.¹¹ The process of drawing and coloring mandalas enables individuals to transform subconscious thoughts and emotions into tangible forms, enhancing self-awareness and promoting emotional balance.⁶ Moreover, research has shown that mandala practices induce a meditative relaxation effect, reducing stress levels and increasing psychological resilience.¹² Mandala art therapy is believed to be effective in alleviating death anxiety among older adults. Such interventions can help reduce negative thoughts and concerns about death, fostering existential peace and acceptance. Additionally, conducting art therapy in individual and group formats can encourage social interaction, mitigating feelings of loneliness and strengthening social bonds.¹³ In conclusion, mandala art therapy has the potential to be a significant emotional regulation tool for older adults. Particularly in reducing death anxiety, enhancing psychological well-being, and improving life satisfaction, mandala art therapy can be considered an effective intervention method. Further research is needed to explore the long-term effects of mandala art therapy and its applicability across different cultural contexts. Additionally, integrating art therapy programs with multidisciplinary approaches may yield more comprehensive and effective outcomes in promoting the mental health of older adults.^{9–12}

Given the potential of mandala art therapy's relaxing and calming effects, exploring its benefits for nursing care and contributing to the literature regarding death anxiety and anger in nursing home residents is highly significant. A review of existing literature reveals a gap in research examining the impact of mandala art therapy on death anxiety and anger levels in this population. This study aims to investigate the effects of an art-based mandala intervention on anger levels and death anxiety in older adults residing in a nursing home.

There were two research hypotheses:

H1: Mandala art therapy reduces death anxiety levels in older adults.

H2: Mandala art therapy reduces anger levels in older adults.

Methods

Study design

This randomized controlled experimental study was conducted at nursing home in İstanbul between May 26, 2023, and August 25, 2024, involving 80 participants aged 65 and over. The study complied with the guidelines of Consolidated Standards of Reporting Trials (CONSORT) checklist.

Setting and sample

This study was conducted with older adults residing in a nursing home in İstanbul. The nursing home has a capacity of 256 residents, offering single and double occupancy rooms. It features a dining hall, lounges, a well-equipped library with reading rooms, a gymnasium for social activities, a workshop for crafts, and a spacious garden. Healthcare services, including a physician, nurses, a psychologist, and a physiotherapist, are also available on-site. The inclusion criteria for the study were: residing in the nursing home, being 65 years of age or older, scoring 24 or more points on the Mini-Mental State Examination, having no psychiatric diagnoses, not currently participating in courses related to coping with anxiety and stress, and voluntarily agreeing to participate in the study.

Research method

This randomized controlled trial involved older adults who engaged in mandala coloring three times a week for 12 weeks. Based on the assumption that mandala coloring could reduce thanatophobia (fear of death) levels by 30 % (effect size d_z : 0.5), a sample size of at least 35 participants per group was determined using a power of 95 %, alpha of 0.05, and beta of 0.20. Anticipating potential attrition, 100 participants were initially enrolled. After applying exclusion criteria, the study was completed with 80 participants (experimental group $n = 40$; control group $n = 40$). The researchers created a flow diagram based on CONSORT guidelines. Due to the nature of the intervention, blinding of the participants was not possible. Upon study completion, an independent statistician, blinded to group allocation, analyzed the data and reported the findings. To ensure the integrity of the study, blinding procedures were implemented during the evaluation of results. Data collection was performed by two nursing students to maintain blinding.

Data collection

At baseline and after the 12-week intervention, all participants were assessed for anger levels and death anxiety.

Descriptive Characteristics Form: This researcher-developed form collected demographic and background information, including age, height, body weight, gender, active employment status, marital status, length of stay in nursing home. The form consisted of 7 questions.

Death Anxiety Scale: The validity and reliability study of the Turkish version of the "Death Anxiety Scale" (Templer, 1970) that was developed by Templer¹⁴ was conducted by Akça and Köse¹⁵ The scale 15-item true/false scale measures anxiety and fear related to one's own death and mortality risk. Templer reported a test-retest reliability of 0.83. Each "yes" response to the first nine items and each "no" response to the remaining six items receives a score of "1." The total score indicates the level of death anxiety. The maximum possible score is 15, with scores interpreted as follows: 0–4 (mild), 5–9 (moderate), 10–14 (severe), and 15 (panic). The scale was translated and validated for use in Turkey by Şenol, who reported a

Cronbach's alpha of 0.86. In the present study, the Cronbach's alpha for the scale was 0.88.

State-Trait Anger Expression Inventory: Developed by Spielberger¹⁶ et al. and adapted to Turkish by Özer,¹⁷ the STAXI can be administered individually or in groups to adolescents and adults. The scale has two components: State Anger and Anger Expression. The Anger Expression component consists of three subscales: Anger-In, Anger-Out, and Anger Control. The full scale comprises 34 items (10 for State Anger and 24 for Anger Expression) with a 4-point Likert-type response format (1: Never/Almost Never - 4: Always/Almost Always). No reverse-scored items are included. Özer reported Cronbach's alpha coefficients ranging from .73 to .84 and item-total correlations between .14 and .56. In the present study, only anger expression was assessed, with a Cronbach's alpha of 0.84. The Cronbach's alpha values for the subscales were as follows: Anger Control (0.91), Anger-Out (0.82), and Anger-In (0.85).

Procedure

After obtaining ethical approval and institutional permissions, the nurses and administrators of the nursing home where the study took place were informed about the study procedures. A suitable environment for the mandala intervention was prepared, including a room with controlled lighting and temperature, and comfortable chairs. Informed Consent Forms were obtained from the sampled patients in both the experimental and control groups. Assessment forms were completed. As the study involved mandala coloring, the researcher underwent training in art-based mandala techniques as a preparatory step. The experimental and control groups were formed using block randomization. For the gender variable, two different blocks, woman and man were defined. The randomization list was prepared using an online blocked randomization tool. (Sealed Envelope Ltd., 2024). In the study, the strata were repeated 7 times to ensure an equal number of participants were assigned to each group. This arrangement allowed for the inclusion of 40 participants in each of the groups, following a $2 \times 2 \times 7$ scheme. The coding of the control and intervention groups as A and B was performed using the sealed envelope method. Randomization information was concealed from the researcher responsible for data collection until the intervention began. The researcher learned which group each participant belonged to immediately before the intervention. An intervention schedule was developed for the experimental group, taking into account their existing care and treatment plans. The mandala instructor successfully completed the 18-hour online and 8-hour practical Mandala Art Therapy Training Certificate Program, organized by the Continuous Education Application and Research Center of a university in Istanbul. Subsequently, the instructor was awarded a certificate upon completing the International Mandala Philosophy Method Coaching Program offered by an institution specializing in Mandala training.

Interventions

A literature review was conducted on the frequency and number of mandalas to be applied to patients in the intervention group. Each participant in the experimental group received mandala coloring pages and a set of 12 colored crayons from the researcher. The choice of coloring medium (felt-tip pens, crayons, or ink) was determined by majority vote. The experimental group completed the questionnaires. Subsequently, the experimental group participated in mandala practice for three times weekly for 12 weeks.

In this study, a standard application guide was created for the mandala coloring process applied to the intervention group. Each session lasted 120 min. The sessions consisted of preparation (10 min), introduction (5 min), mandala coloring (90 min), and conclusion

(15 min) stages. During the preparation stage, the researcher arranged the environment, ensured phones were silenced, and prepared the coloring materials. During the introduction, the certified mandala instructor reminded participants of the session rules and stated, 'Please silence your phones and express your emotions through colors.' In the coloring stage, participants quietly colored their chosen mandala designs. At the conclusion, participants who wished to do so made a brief verbal share.

In the application, only designs prepared in a circular form were used. The study material, titled 'Mandala Booklet,' consists of a total of 20 different circular mandala designs in addition to brief information about mandalas. Participants were instructed to choose a different design for each session, and a total of 16 different mandalas were colored. For coloring, all participants were given a standard dry paint set consisting of 12 colors, thus ensuring consistency in the materials used. The sessions were conducted in a quiet classroom environment with adequate lighting, where tables were arranged in a circular formation.

In each session, there was one certified mandala instructor and one researcher present. The instructor was responsible only for guidance and reminders, while the researcher monitored the time, maintained environmental order, and controlled the implementation of the protocol. Groups consisted of 8–10 people, and the participant-to-instructor ratio did not exceed 10 in any session.

To ensure the standardization of the application, the same instructor and researcher were present in every session. All participants used the same mandala booklet and the same paint set. Attendance to the sessions was regularly recorded, and absences were noted. Furthermore, environmental conditions (lighting, seating arrangement, music) were maintained similarly across all sessions.

At the end of the 12th week, the scales were re-administered. The control group received no intervention; their death anxiety and anger levels were measured only during the initial test and the final test at the end of the 12th week.

Data analysis

Descriptive statistics, including percentages, means, standard deviations, minimum, and maximum values, were used to present the characteristics of the patients included in the study.

For comparisons between two independent groups, Student's *t*-test was used for normally distributed data, and the Mann-Whitney U test was used for data that did not meet the assumptions of normal distribution. Paired samples *t*-tests were conducted for dependent two-group comparisons when the data met the assumptions of normal distribution. The Wilcoxon signed-rank test was employed for non-normally distributed data. Spearman's rank-order correlation was used to analyze relationships between numerical variables when parametric test assumptions were not met. Chi-square tests were performed to compare differences in proportions between groups. Statistical significance was set at $p < 0.05$. An intention-to-treat analysis was conducted on the data from all 80 participants.

Ethical considerations

Prior to commencing the study, approval was obtained from the Süleyman Yalçın City Hospital Clinical Research Ethics Committee (approval number 2021/0569). Participants received verbal and written information about the study's purpose, the voluntary nature of participation, and the confidentiality of their data. Written informed consent was obtained from all participants, who were assured of their right to withdraw from the study at any time. All participants signed an ethics committee-approved informed consent form. The study adhered to the principles outlined in the Declaration of Helsinki regarding ethical conduct in medical research involving human

Table 1
Comparison of sociodemographic data of participants by groups.

| Variables | Mandala Group (n: 40) Mean±SD | Control Group (n:40) Mean±SD | p (Z) |
|--------------------------------|-------------------------------------|------------------------------------|--------------------|
| Age (years) | 76,45±8.52 | 73,18±7,15 | 0368 (-0,95) |
| Height (cm) | 158,21±7,56 | 163,25±8.16 | 0006* (-2,8) |
| Body weight (kg) | 71,31±10.58 | 71,58±10.66 | 0369 (-0,82) |
| | n (%) | n (%) | p |
| Gender | | | |
| Woman | 21 (53) | 22 (55) | 0240 |
| Male | 19 (47) | 18 (45) | 3.055 ^b |
| Active Employment Status | | | |
| Yes | 5 (13) | 4 (10) | 0364 |
| No. | 35 (87) | 36 (90) | 1.963 ^b |
| Marital status | | | |
| Married | 5 (13) | 3 (7) | 0268 |
| Single | 35 (87) | 37 (93) | 1.059 ^b |
| Length of Stay in Nursing Home | | | |
| 1 year and less | 9 (22) | 8 (20) | 0.747 |
| 2-4 years | 12 (30) | 11 (28) | 0.582 ^b |
| 5 Years and above | 19 (48) | 21 (52) | |

aMann-Whitney U test.

^b Chi-square test *p<0.01.

subjects. Following the study's completion, mandala art therapy was offered to members of the control group who expressed interest.

Results

The participants' mean age was 74.82 ± 8.14 years. No significant differences ($p > 0.05$) were found between the two groups in terms of age, body weight, gender, employment status, and marital status (Table 1).

Research hypothesis 1: stress scores

As shown in Table 2, there was no statistically significant difference between the two groups' pre-test STAXI subscale scores. ($p > 0.05$).

Following the mandala intervention, statistically significant differences were also found between the experimental and control groups in State-Trait Anger, Trait Anger In, Trait Anger Out, and Anger Control scores after the mandala intervention. ($p < 0.01$) These results support the first research hypothesis.

Table 2
Comparison of the total scores STAI of the individuals in the mandala and control groups.

| Variables | Experimental Group (n: 40) Mean±SD | Control Group (n:40) Mean±SD | t* | P |
|-------------------|------------------------------------------|------------------------------------|-------|-------|
| Pre-Test | | | | |
| State-Trait Anger | 31.05±4.85 | 30.52±22.96 | 0.56 | 0.36 |
| Anger -In | 19.99±2.98 | 20.02±3.85 | 0.87 | 0.32 |
| Anger -Out | 22.86±5.65 | 22.36±1.89 | 0.75 | 0.26 |
| Anger Control | 14.98±1.13 | 13.88±2.05 | 1.12 | 0.22 |
| Final Test | | | | |
| State-Trait Anger | 19.65±3.85 | 30.025±3.56 | -8.59 | 0.001 |
| Anger -In | 17.58±2.89 | 19.09±2.27 | -2.23 | 0.001 |
| Anger -Out | 15.58±1.25 | 21.21±1.59 | -8.56 | 0.001 |
| Anger Control | 22.64±2.29 | 13.58±1.89 | 6.85 | 0.001 |

* Independent samples t-test.

Table 3
Comparison of posttest death anxiety scale total scores of individuals in mandala and control groups.

| Variables | Experimental Group (n: 40) Mean±SD | Control Group (n: 40) Mean±SD | t | p |
|------------------------------------|---------------------------------------------|----------------------------------------|-------|-------|
| Pre-Test | | | | |
| Death Anxiety Scale Total Score | 7.99±1.98 | 8.02±1.85 | 0.879 | 0.33 |
| Final Test | | | | |
| Death Anxiety Scale Total Score | 6.72±0.98 | 7.98±0.98 | 3.65 | 0.001 |

*Independent samples t-test.

Table 4
Results of multiple linear regression analyses for the death anxiety scale and the sub-dimensions of the SLTS.

| Model | Variables | Multivariable | | | | |
|-------|--------------------|---------------|---------|--------------|--------|--------|
| | | B | S.Error | Standard (B) | t | p |
| 1 | State- Trait Anger | 12.925 | 3.152 | 0.385 | 4.101 | 0.001* |
| | Anger -In | 10.314 | 4.151 | 0.217 | -2.485 | 0.001* |
| | Anger -Out | 16.851 | 4.648 | 0.33 | 3.626 | 0.001* |
| | Anger Control | 7.2 | 3.764 | 0.182 | 1.913 | 0.059 |

F = 8.820, R = 0.628, R²=0.424, *p < 0.05

Research hypothesis 2: death anxiety scores

Before the mandala intervention, the mean death anxiety scale scores were 7.99 ± 1.98 for the experimental group and 8.02 ± 1.85 for the control group. There was no statistically significant difference between the two groups' pre-test death anxiety scores ($p > 0.05$). However, after the mandala intervention, the experimental group showed a statistically significant decrease in death anxiety scores ($p < 0.01$), confirming Hypothesis 2 (Table 3).

As shown in Table 4, the multiple linear regression analysis conducted to determine the effect of anger scale independent variables on death anxiety was statistically significant ($F = 8.820$; $p = 0.001$). The independent variables in the model explain 42.4 % of the total variance in death anxiety ($p < 0.05$) (Table 4).

A statistically significant positive correlation was found between the State-Trait Anger Expression Inventory sub-dimensions and the length of stay in the nursing home ($p < 0.05$). (Table 5).

Discussion

Art-based mandala interventions allow individuals to externalize and visualize their stress and distress.¹⁸ This study investigated the effects of an art-based mandala intervention on anger levels and death anxiety in older adults residing in a nursing home. Old age is a period characterized by physical and psychological losses, decreased social interaction, and heightened awareness of mortality due to being in the final stage of the life cycle. It is a time when individuals confront the inevitability of death and the limitations of their remaining time, often leading to increased death anxiety. During this period, individuals frequently experience anxiety and anger.³ In anxious individuals, drawing and painting increase dopamine levels, promoting relaxation in the neurological system.¹⁹ Mandala coloring helps geriatric individuals put aside anger and anxiety-provoking thoughts by focusing their minds on coloring patterns, which can contribute to feelings of happiness and balance.¹⁸ In this study, when comparing the mean anger scores of older individuals in the intervention and control groups after the mandala coloring application, it was found that the decrease in mean anger scores in the intervention group was

Table 5

Correlation analysis of sociodemographic characteristics, death anxiety, anger scale subscales.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------------------------------------------|---|--------|-------|--------|-------|--------|--------|-------|-------|---|----|----|
| 1. Age | r | 1 | | | | | | | | | | |
| | p | . | | | | | | | | | | |
| 2. Boy | r | .381* | 1 | | | | | | | | | |
| | p | .065 | . | | | | | | | | | |
| 3. Length of stay in nursing home 1 year or less | r | 0.179 | 0.007 | 1 | | | | | | | | |
| | p | .071 | .944 | . | | | | | | | | |
| 4. Length of stay in a nursing home 2–4 years | r | .195 | .062 | .504* | 1 | | | | | | | |
| | p | .049 | .533 | .085 | . | | | | | | | |
| 5. Length of stay in nursing home 5 years or more | r | 0.13 | 0.033 | .442* | .568* | 1 | | | | | | |
| | p | .192 | .744 | .521 | .096 | - | | | | | | |
| 6. State-Trait Anger | r | 0.119 | 0.102 | .306** | .374* | .342* | 1 | | | | | |
| | p | .229 | .303 | .002 | .000 | .000 | . | | | | | |
| 7. Anger -In | r | .216* | .038 | .672* | .919* | .749* | .312** | 1 | | | | |
| | p | 0.018 | .703 | .000 | .000 | .000 | .001 | . | | | | |
| 8. Anger -Out | r | .030 | 0.149 | .238* | .329* | .522** | .435* | .461* | 1 | | | |
| | p | .032 | .133 | .015 | .001 | .023 | .000 | .000 | . | | | |
| 9. Anger Control | r | −0.032 | 0 | 0.167 | .266* | .306** | .374* | .342* | .440* | 1 | | |
| | p | .046 | 0.183 | .0025 | .007 | .002 | .000 | .000 | .000 | . | | |

Spearman's *p < 0.05 Pearson **p < 0.05.

significant compared to the control group. Studies conducted with different groups have shown that using mandala coloring methods reduces anxiety and anger levels.^{19,20} Based on this information, it can be suggested that nurses could use mandala coloring methods to reduce anger and anxiety levels not only in elderly individuals living in nursing homes but in all geriatric individuals.

Death is a universal source of fear and anxiety, regardless of age, due to its finality and the uncertainty of what follows. However, older adults are often more profoundly affected by this reality. The fear of death is a significant issue that warrants attention and should not be neglected, as it can contribute to mental health problems. A study by Afrashteh et al. found that elderly individuals living in nursing homes experienced high levels of death anxiety.²¹ Other studies have also reported moderate levels of death anxiety among older adults in care facilities, with factors such as age, gender, and marital status influencing these findings.²² According to research conducted by Azeem and Naz older adults living at home experience lower levels of death anxiety compared to those living in institutions.²³ Furthermore, they reported that the acceptance of death and a subsequent decrease in death anxiety are associated with increased maturity that comes with advancing age.

Roh et al. found that mandala coloring reduced death anxiety in older adults. These findings align with the results of the present study.²⁴ Furthermore, existing literature supports the effectiveness of mandala interventions in reducing both death anxiety and general anxiety.^{6,9,10} Additionally, a systematic review by Jakobsson Støre and Jakobsson indicated significant positive effects of mandala art therapy on various aspects of psychological well-being and anxiety levels in both older adults and patients, while also emphasizing the need for further research.²⁵ The interactive nature of the intervention, conducted in a group setting, likely contributed to its effectiveness. Literature suggests that group-based interventions yield more positive outcomes.²⁶ The intervention's frequency of twice a week for three weeks, allowing for more frequent patient contact, is also thought to have been beneficial.

The literature presents conflicting findings regarding the relationship between death anxiety and sociodemographic characteristics in older adults, with living conditions, environmental factors, and individual differences playing significant roles.^{26,27} Some studies suggest that death anxiety increases with age, while others report a decrease, a curvilinear relationship (increasing and then decreasing), or stabilization after a certain age. Life history, health status, socioeconomic status, and adaptation to the aging process have also been identified

as influential factors.^{28–30} In contrast, a study by Gümüş Demir found no significant difference.³¹

Mandala interventions and emotion regulation strategies are increasingly explored for their potential to reduce anxiety, anger, and distress, especially in older adults. Understanding their neurobiological mechanisms and cognitive restructuring processes is crucial for developing effective interventions targeting death anxiety and emotional well-being in the elderly. Older adults generally demonstrate greater emotional control and more frequent use of adaptive emotion regulation strategies, such as cognitive reappraisal, compared to younger adults. These adaptive strategies are linked to better psychological outcomes and resilience in the face of chronic illness or distress.^{29,30} Cognitive restructuring, a core component of cognitive-behavioral therapy, is effective in reducing the impact of anxiety and depression on metacognition in older people.³² Emotion regulation strategies, including cognitive therapies, engage overlapping neural circuits, particularly in the prefrontal cortex and amygdala. Neuroimaging studies show that interventions like mandala targeting these mechanisms can enhance emotion regulation and may induce neural plasticity, supporting their use in trauma and stress-related conditions.^{33,34}

The interactive and social nature of the intervention, conducted in a group setting, may have further enhanced its effectiveness. The literature suggests that group-based interventions yield more substantial psychological benefits compared to individual interventions, as they foster social engagement and emotional support among participants.^{2,26} Additionally, the frequency of the intervention, twice a week over three weeks, likely contributed to its efficacy by ensuring consistent exposure and reinforcement of the therapeutic effects. Future studies should explore whether longer intervention durations yield even more pronounced benefits.

The relationship between death anxiety and sociodemographic factors among older adults remains a subject of debate in the literature. Several studies suggest that death anxiety increases with age, while others propose a decrease, a curvilinear pattern (initial increase followed by decline), or stabilization at a certain stage.^{28–30} Factors such as personal life history, health status, socioeconomic background, and psychological adaptation to aging have been identified as key determinants of death anxiety levels. However, conflicting findings exist; for example, Gümüş Demir found no significant association between age and death anxiety.³¹

Regarding the relationship between nursing home residency and death anxiety, previous research has yielded mixed results. Some



CONSORT

TRANSPARENT REPORTING of TRIALS

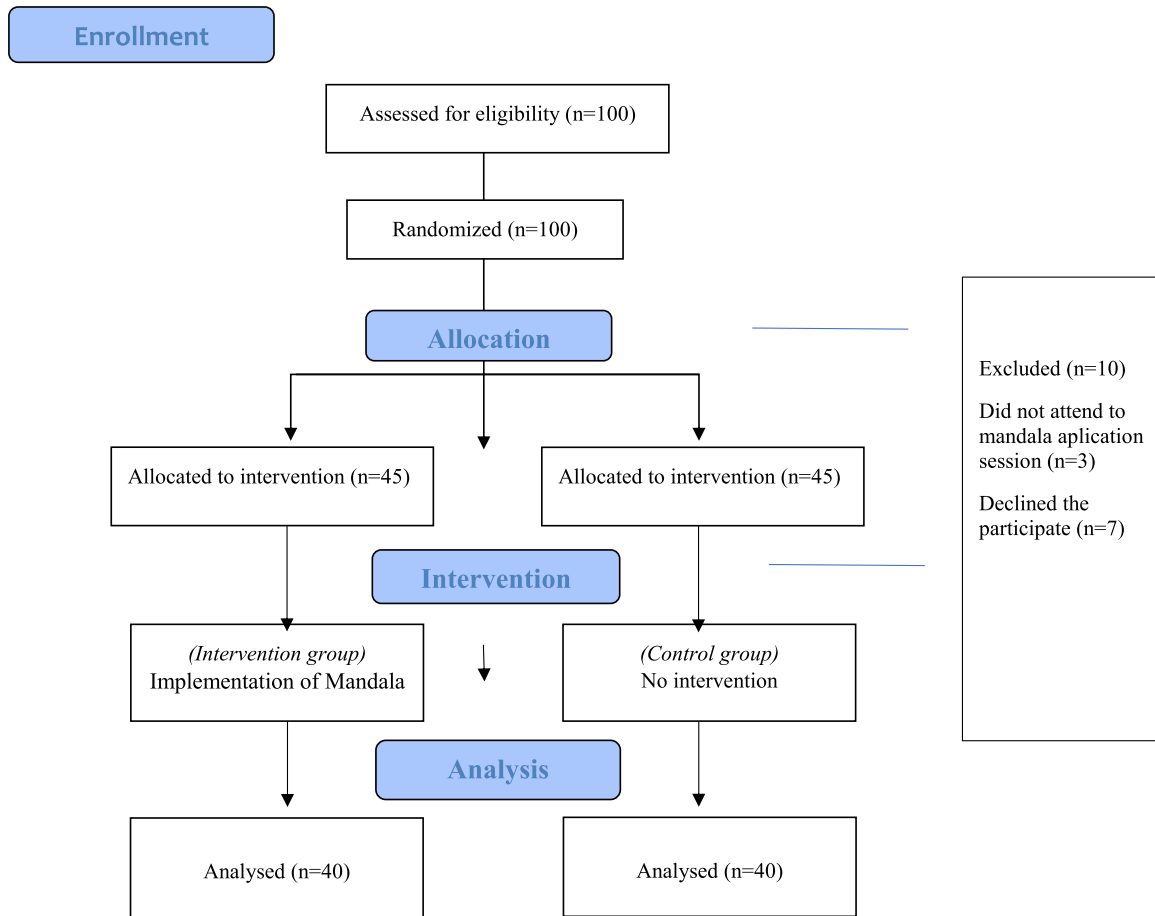


Fig. 1. Allocation of subjects according to the CONSORT 2010 Flow Diagram.

studies have reported a significant correlation between the length of stay in a nursing home and increased death anxiety,³⁰ while others have found no such relationship.³⁵ In the present study, overall death anxiety levels were found to be relatively low, and no significant relationship was observed between the length of nursing home residency and death anxiety ($p > 0.05$). Additionally, no statistically significant differences were found in mean death anxiety scores based on variables such as duration of stay, frequency of visits, and visitors' identity ($p > 0.05$). These findings suggest that multiple environmental and individual factors likely influence death anxiety, warranting further investigation.

Many studies indicate that the application of mandala intervention for a specific duration and at regular intervals leads to significant reductions in anxiety, stress, and psychological symptoms. For example, a randomized controlled study conducted on COVID-19 patients found that mandala coloring, applied once a day for 30 min over six days, resulted in a significant decrease in anxiety levels.³⁶ In cancer patients, significant reductions in anxiety scores were observed when a two-hour mandala intervention was applied once a week for eight weeks.²⁰ Similarly, studies conducted on children have reported that six sessions of daily 45-minute applications reduced anxiety levels.³⁷ Conversely, short-term (15–20 min), single-session applications have been reported in some studies to show no significant difference or to have limited effects.¹⁹ It has been emphasized in

studies that there is a positive relationship between intervention duration and anxiety reduction, meaning that longer and repeated applications yield greater benefits. Furthermore, it has been stated that not only the total duration of the intervention but also the regular and consecutive nature of the sessions enhances the effect.^{20,38} This study's exclusive focus on the short-term effects of the intervention and the absence of follow-up assessments limit the evaluation of long-term effects. This situation prevents drawing a definitive conclusion on whether the observed reductions in death anxiety and anger levels at the end of the 12-week intervention are maintained, decrease, or further increase over time. Previous studies on similar art-based and mindfulness-focused interventions have reported that, in some research, the effects persisted for several months, while in others, they diminished over time with the cessation of structured sessions. Therefore, it is recommended that future studies incorporate follow-up assessments at different time points to more comprehensively understand the long-term benefits and potential changes in the intervention's effects.

The present study is the use of a passive control group that received only usual care. While many studies have used passive control groups to compare mandala art therapy with alternative or standard interventions, some studies have also employed active control groups, which generally perform better than passive controls.^{39,40} In future research, the inclusion of active



Fig. 2. Mandala figures.

control conditions, such as drawing non-mandala pictures or coloring neutral geometric shapes, will help to more clearly elucidate the specific mechanisms of the mandala application. Furthermore, experimental studies comparing different art forms can clarify whether mandala coloring provides distinctive therapeutic benefits beyond general artistic engagement.

The universally used mandala, adapted to many cultures, serves as a tool for meditation and spiritual development in Hinduism and Buddhism.⁴¹ Many studies evaluating the effectiveness of mandala application in different countries are available in the literature.^{25,39,40} This universality emphasizes the role of mandala practice as a symbol of cross-cultural harmony and integration. Recent research on mandala intervention, which is also suitable for Turkish culture^{42–44} has focused on the therapeutic use of mandala art and presents positive findings. Mandala art therapy is accessible, affordable, and can be easily integrated into healthcare practices in a culturally appropriate manner.

Strengths and limitations

This study contributes to the growing body of research on non-pharmacological interventions for psychological distress in older adults. By employing an art-based mandala intervention, this study offers an alternative therapeutic approach that is both cost-effective and easily implementable in institutional settings. Given the growing emphasis on holistic and psychosocial interventions in geriatric care, these findings are particularly valuable for healthcare professionals seeking non-invasive strategies to improve the emotional well-being of older adults. Another notable strength is the structured and interactive nature of the intervention. The group-based format not only facilitated artistic engagement but also promoted social interaction among participants, potentially contributing to the observed psychological benefits. Prior research suggests that social engagement plays a crucial role in mitigating anxiety and enhancing emotional well-being in older adults.^{5,13,25,39} The twice-weekly intervention schedule

over three weeks further ensured regular exposure and engagement, which may have reinforced the therapeutic effects of mandala coloring. Moreover, the study expands current knowledge on death anxiety by addressing a relatively underexplored aspect—its relationship with anger regulation. By demonstrating a significant association between anger expression and death anxiety, this research provides insights that could inform future interdisciplinary interventions targeting both constructs simultaneously. Finally, the study's sample, drawn from a nursing home population, adds to the limited but growing research on institutionalized older adults. As aging populations increase worldwide, understanding psychological distress in long-term care settings becomes increasingly important for shaping evidence-based interventions tailored to this demographic.

This study has several limitations. First, the sample size was relatively small and limited to a specific population, reducing the generalizability of the findings. Future research should include larger and more diverse samples to strengthen external validity. Expanding data collection across multiple cities and countries could provide a more comprehensive understanding of the effects of mandala interventions in different cultural and demographic contexts. While Istanbul was chosen as the study site due to its high elderly population and concentration of nursing homes, broader regional comparisons could yield additional insights. Another limitation is the reliance on self-report measures to assess anger and death anxiety levels. Although validated and reliable scales were used, the absence of expert psychological evaluations may have influenced the results. Future studies should incorporate qualitative assessments or clinician-administered evaluations to triangulate findings. Additionally, the study did not control for all potential confounding factors that may affect anger and death anxiety, such as personal coping strategies, past trauma, religious beliefs, and social support networks. Further research is needed to explore these variables and their interactions with art-based interventions. Finally, while the study demonstrated the efficacy of mandala coloring in reducing anger and death anxiety, future research should compare its effects with other art therapy techniques or psychological interventions. Conducting similar studies in different nursing homes and assessing the impact of alternative therapeutic approaches could help determine the most effective strategies for improving mental well-being in older adults. [Fig 1](#), [Fig 2](#)

Conclusion

In this context, mandala coloring is considered an effective supportive method that can be implemented by nurses to reduce perceived stress, anger, and anxiety levels in elderly individuals living in nursing homes. Based on the study's findings, art-based mandala intervention can be recommended for patients with high anxiety levels due to its easy applicability and therapeutic approach. This practice can also contribute to a happier, more peaceful, and healthier aging process, enhancing individuals' quality of life. However, further research is needed to strengthen the evidence base for art-based mandala interventions and contribute to the existing literature.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

BERNA DINCER reports a relationship with Istanbul Medeniyet University that includes: board membership and employment. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRedit authorship contribution statement

Berna Dincer: Validation, Supervision, Methodology, Investigation, Data curation, Conceptualization. **Serdar Demir:** Methodology, Investigation, Data curation. **Kemal Demir:** Writing – original draft, Methodology, Investigation, Data curation. **Kerime Özalp:** Investigation, Conceptualization. **Elif Yıldırım Ayaz:** Methodology, Investigation, Conceptualization. **Ayşe Nefise Bahçecik:** Writing – original draft, Methodology, Funding acquisition, Data curation, Conceptualization. **Selda Çelik:** Writing – original draft, Methodology, Investigation, Conceptualization. **Deniz Bozkurt:** Writing – review & editing, Writing – original draft.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.gerinurse.2026.103956](https://doi.org/10.1016/j.gerinurse.2026.103956).

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