

# Effectiveness of Mandala Therapy on Nausea, Pain and Distress among Cancer Patients Receiving Chemotherapy

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## Abstract

Cancer is the leading cause of death worldwide. Its treatment consists of surgical therapy, chemotherapy, radiotherapy, and hormonal therapy, alone or in combination. Among these, chemotherapy causes the most physical changes. The study aimed to assess the effectiveness of Mandala therapy on nausea, pain and distress among patients with cancer receiving chemotherapy. A true experimental research design was carried out among 80 patients (randomised to 40 each in the control and experimental group), selected by a consecutive sampling technique in a selected tertiary care centre. The baseline characteristics were assessed using pre-tested and pre-determined tools such as demographic variables proforma, clinical variables proforma, nausea and vomiting tool, numerical pain rating scale and distress thermometer in both the groups. After the pre-test, mandala therapy was given to the experimental group of patients after 1 hour of starting the chemotherapy for 2-3 hours. Immediately after the intervention, post-test assessment of nausea, pain and distress was done in both the groups with the same tool. The collected data were analysed by using descriptive and inferential statistics. The study findings showed that there was a significant difference in post-test pain and distress (0.65 and 0.72) than the control group at  $p < 0.005$  level, without any changes in the nausea score indicating that Mandala therapy is effective in reducing pain and distress among patients with cancer receiving chemotherapy.

**Key words:** Mandala therapy, Nausea, Chemotherapy

Cancer is the leading cause of death worldwide, accounting for nearly 10 million deaths in 2020 (WHO, 2022). Worldwide, 19.3 million new cancer cases and almost 10 million cancer deaths occurred in 2020 (Sung et al, 2021). Chemotherapy medications are used either alone or in conjunction with other drugs because cancer cells grow and proliferate considerably more quickly than most other cells in the body. Chemotherapy has a high risk of side effects, even if it is an effective treatment for many cancer types. While some side effects of chemotherapy are manageable and modest, especially acute nausea and vomiting (Akbulak & Can, 2023; Mayo clinic, 2022). According to the Turkish Art Psychotherapy Association, art therapy is a type of psychotherapy that makes use of the opportunities for self-expression provided by various artistic disciplines, including visual art, music, motion/dance, and drama, to promote mental and physical health as well as emotional, social, and cognitive well-being of both individuals and groups (Akbulak & Can, 2023). Mandala therapy is one of the art therapies which helps relax the mind. Mandala is a symbol of the universe in its ideal form, and its creation signifies

the transformation of a universe of suffering into one of joy. Many people find the drawing or colouring of a mandala to be meditative. As they focus on colouring in the patterns of the form, they relax, their mind grows quiet, and they may enter into a spiritual space.

Research suggests complementary therapies like yoga, panic healing, music, and virtual reality can help reduce these effects. Art therapy is also a crucial treatment for cancer symptoms (Nainis et al, 2006). Art therapy is beneficial due to its triadic interaction and dyadic relationship, allowing patients to express feelings and seek meaning. Painting therapy, used independently with adult cancer patients, has been found to improve patients' health outcomes, including quality of life, coping with illness, mental health, and physical symptoms (Forzoni et al, 2010; Ding et al, 2019).

Mandala therapy given during the chemotherapy session helps to divert the mind of the patient, and it will reduce nausea, pain and distress in patients with cancer receiving chemotherapy. But there is a paucity of studies in India on the effectiveness of mandala art therapy among patients undergoing chemotherapy. Therefore, this study was undertaken by the researcher to assess the effectiveness of mandala therapy among patients on chemotherapy.

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## Objective

1. To determine the effectiveness of mandala therapy on nausea, pain and distress among patients with cancer receiving chemotherapy.
2. To determine the level of acceptability of mandala therapy among the experimental group of patients with cancer receiving chemotherapy.
3. To determine the correlation between nausea, pain and distress among control and experimental groups of patients with cancer receiving chemotherapy.

## Review of Literature

Akbulak et al (2022) conducted a study to assess the effectiveness of mandala colouring to reduce the anxiety level in cancer patients receiving chemotherapy for the first time. In this study, the patients were asked to colour the mandala for 30 minutes while receiving the premedication before chemotherapy. The result has shown that there is no change in pre- and post-level distress in the control group, but in experimental group has a significant reduction in the distress level.

A semi-experimental study with the single-group pre-test-post-test design was conducted by Yakar et al (2021) to assess the effects of art-based mandala intervention on distress and anxiety in cancer patients. Patients participated in the “Art-based Mandala Intervention” for eight weeks, one day a week, 2 hours per session. Finally, the study concluded that the anxiety score decreased and the distress score increased after the interventional programme.

The effects of mindfulness-based mandala colouring, made in nature, on chronic widespread musculoskeletal pain is an experimental study conducted by Choi et al (2021). The authors concluded that mindfulness-based mandala colouring showed a positive effect on reducing the chronic pain and stress level in individuals suffering from chronic widespread pain.

Joshi et al (2021) conducted a quantitative experimental study to assess the mindfulness-based art therapy upon psychological distress and spiritual wellbeing in breast cancer patients. This study also concluded that mindfulness-based art therapy decreases psychological distress and significantly improves psychological well-being in terms of meaning, peace and faith.

Effects of mandala colouring on mindfulness, spirituality and subject wellbeing study was conducted by Liu et al, (20219). The study results show that subject wellbeing significantly increased (mean score of 3.96 and 4.67 at pre-and posttest, respectively) and there is a positive correlation between mindfulness, spirituality and subject wellbeing.

## Materials and Methods

After completing Advanced Mandala Courses, a true experimental research design was carried out for six weeks during May and June 2023, among patients with cancer receiving chemotherapy in the tertiary care hospital in Chennai. Institutional ethics clearance and permission from the concerned authorities were obtained. An extensive review of literature laid the foundation for the development of study instruments such as demographic variables proforma, clinical variables proforma, nausea and vomiting tool, numerical pain rating scale and distress thermometer. Content validity of the tool was obtained from the experts. Reliability was obtained by Cronbach’s alpha for the nausea and vomiting tool ( $r = 0.75$ ), numerical pain rating scale ( $r = 1$ ) and distress thermometer ( $r = 0.75$ ).

A pilot study was conducted to determine the feasibility and practicability. Sample size was calculated with OpenEPI, based on the previous study conducted by Molassiotis (2006) with the mean and standard deviation of  $2.72 \pm 3.1$  (control group) and  $0.87 \pm 2.2$  (experimental group). The calculated sample size was 68 samples (34 each) with 95 percent & 80 percent confidence intervals and power. For better generalisation and considering the attrition rate of 10 percent, 80 patients (40 patients in the control and 40 patients in the experimental group) were selected in the study. A total of 80 patients with cancer receiving chemotherapy were selected by a consecutive sampling technique by odd and even method, 40 patients in the experimental group and 40 patients in the control group.

The study included the clients admitted for chemotherapy, aged 21-59 years, who knew Tamil/English and who had undergone 2 cycles of chemotherapy. Patients who were critically ill and who were not willing to participate in the study, admitted in Immuno ICU, having cognitive impairment, dementia and psychological problems were excluded. The researchers briefly explained the purpose of research to the selected patients, and consent was obtained from them. A pre-test was conducted by using the pre-determined tool for both the control and experimental groups. The patients were provided with some printed mandala pictures and they were asked to colour the picture for 2-3 hours, with colour pencils given by the researcher after 1 hour of starting chemotherapy. Post-test was conducted immediately after the intervention with the same tool for the control and experimental groups of patients with cancer receiving chemotherapy. The collected data was analysed using descriptive (frequency and percentage, mean and standard deviation) and inferential statistics (paired ‘t’ test, Independent ‘t’ test, and Pearson’s correlation).

## Results

The background variable distribution in the study revealed that, half of them were aged between 51-59 years, females, married, graduates, government private employees with a monthly income > 60,001 in INR, performing moderate level of activity and consuming both vegetarian and non-vegetarian and they were on normal diet in control and experimental group respectively. Both groups were homogeneous concerning demographic variables.

About clinical variables among the study participants that, half of them had primary cancer in the reproductive organ for <1 year, without any comorbidities, most of them were in the third stage of the cancer without metastasis, with length of hospital stay of ≤ 3 days, not received any radiation therapy, no history of surgery, none of them were on alternative therapy, most of them were on day 1<sup>st</sup> of chemotherapy, more than half of them were in 3<sup>rd</sup>-5<sup>th</sup> cycle, majority of them were not on analgesics, everyone had antiemetics, nearly half of them were not on any adjuvant therapy and they could perform their ADL independently in control and experimental group respectively.

Table-1 denotes that in experimental group there was a significant difference between pre-test and post-test mean score in nausea ( $1.18 \pm 2.44$  and  $0.33 \pm 1.54$ ), pain ( $1.48 \pm 1.09$  and  $0.83 \pm 0.93$ ) and distress ( $1.55 \pm 0.64$  and  $0.83 \pm 0.45$ ) which was greater than those of control group in nausea ( $1.03 \pm 2.29$  and  $1.65 \pm 0.89$ ), pain ( $1.65 \pm 0.89$  and  $1.18 \pm 0.78$ ) and distress ( $1.7 \pm 0.69$  and  $1.45 \pm 0.59$ ) at  $p < 0.05$ .

In the post-test, there was no significant difference in nausea between the control and experimental groups of patients. In the experimental group, post-test pain and distress scores (1.82 and

5.3) were significantly less than the control group's post-test scores (Table 2). It can be attributed to the effectiveness of Mandala therapy on pain and distress.

Table 3 showed that there was a significant correlation between pain and distress in pre-test and post-test at  $p < 0.05$  in the control and experimental groups.

## Discussion

This study showed that mandala art therapy dramatically lowers chemotherapy-induced nausea, pain, and distress in cancer patients. These findings are supported by earlier research showing that creative pursuits can promote calm and improve physical health. A similar study conducted by (Ayub et al 2023) also showed that about 98.5 percent of the patients were married. 65 percent of the participants were female, mean age was 60.39 years. In that 56 percent were married, 35 percent were retired, 24 percent had some college education, while 41 percent had only completed high school.

The results of the clinical variable were corroborative with a study conducted by Ayub et al (2023) to assess the quality of life and wellbeing among breast cancer patients in Lahore, Pakistan. The clinical variables showed that 6 percent ( $n = 9$ ) of the patients had stage 1 cancer, followed by stage 2 ( $n = 32$ ), stage 3 ( $n = 60$ ), and stage 4 ( $n = 29$ ). About 10 percent ( $n = 14$ ) of the 130 patients did not have surgery, while 89.2 percent ( $n = 116$ ) did.

Effects of art-based mandala intervention among cancer patients were reported in another study resulting in clinically substantial distress ( $4.08 \pm 2.74$ ) and a moderate level of anxiety (50.66

**Table 1: Comparison of mean and standard deviation of nausea, pain and distress scores between pre-test and post-test in control and experimental group (paired t test) of patients with cancer receiving chemotherapy**

| Group                     | Variable | Max. Obtainable score | Pre-test |      | Post-test |      | Paired 't' value | 'p' value |
|---------------------------|----------|-----------------------|----------|------|-----------|------|------------------|-----------|
|                           |          |                       | Mean     | SD   | Mean      | SD   |                  |           |
| Control group (n=40)      | Nausea   | 19                    | 1.03     | 2.39 | 1.65      | 0.89 | 2.49             | 0.008     |
|                           | Pain     | 10                    | 1.65     | 0.89 | 1.18      | 0.78 | 5.94             | 0.001     |
|                           | Distress | 10                    | 1.7      | 0.69 | 1.45      | 0.59 | 3.61             | 0.0004    |
| Experimental group (n=40) | Nausea   | 19                    | 1.18     | 2.44 | 0.33      | 1.54 | 3.1              | 0.001     |
|                           | Pain     | 10                    | 1.48     | 1.09 | 0.83      | 0.93 | 7.71             | 0.001     |
|                           | Distress | 10                    | 1.55     | 0.64 | 0.83      | 0.45 | 8.27             | 0.001     |

**Table 2: Comparison of mean and standard deviation of nausea, pain and distress scores in the pre-test and post-test between control and experimental Group (Independent 't' test) of patients with cancer receiving Chemotherapy**

| Variables | Test      | Control group (n=40) |      | Experimental group (n=40) |      | Mean Diff | Independent 't' value | 'p' value |
|-----------|-----------|----------------------|------|---------------------------|------|-----------|-----------------------|-----------|
|           |           | Mean                 | SD   | Mean                      | SD   |           |                       |           |
| Nausea    | Pre-test  | 1.03                 | 2.39 | 1.18                      | 2.44 | -0.15     | 0.28                  | 0.39      |
|           | Post-test | 1.65                 | 0.89 | 0.33                      | 1.54 | 1.32      | 0.85                  | 0.19      |
| Pain      | Pre-test  | 1.65                 | 0.89 | 1.48                      | 1.09 | 0.17      | 0.78                  | 0.22      |
|           | Post-test | 1.18                 | 0.78 | 0.83                      | 0.93 | 0.35      | 1.82                  | 0.04      |
| Distress  | Pre-test  | 1.7                  | 0.69 | 1.55                      | 0.64 | 0.15      | 1.01                  | 0.16      |
|           | Post-test | 1.45                 | 0.59 | 0.83                      | 0.45 | 0.62      | 5.3                   | <0.001    |

**Table 3: Correlation between nausea, pain and distress among control and experimental groups of patients with cancer receiving chemotherapy in pre-test and post-test**

| Variables          | Control group |         |           |         | Experimental group |         |           |         |
|--------------------|---------------|---------|-----------|---------|--------------------|---------|-----------|---------|
|                    | Pre-test      |         | Post-test |         | Pre-test           |         | Post-test |         |
|                    | r value       | p value | r value   | p value | r value            | p value | r value   | p value |
| Nausea vs Pain     | 0.11          | 0.49    | 0.17      | 0.13    | 0.061              | 0.71    | 0.04      | 0.8     |
| Nausea vs Distress | 0.18          | 0.12    | 0.29      | 0.006   | 0.82               | 0.46    | 0.08      | 0.6     |
| Pain vs Distress   | 0.49          | 0.001   | 0.43      | 0.005   | 0.48               | 0.009   | 0.42      | 0.007   |

± 6.91). Cancer patients' anxiety levels dramatically dropped following the programme compared to before ( $p < 0.05$ ), whereas distress scores went up following the programme compared to before ( $p > 0.05$ ).

Liu et al (2019) conducted a study at Chang Gung University in Taiwan evaluating the effects of mandala colouring on subject well-being, spirituality, and mindfulness among a sample of eighty students. Their study findings revealed that a positive correlation was shown between spirituality, mindfulness, and subjective well-being (mean scores in the pre- and post-tests, respectively, of 4.67 and 3.96).

### Nursing Implications

Chemotherapy can be a stressful treatment for patients and their families, requiring nurses to employ stress-reduction and pain-relieving approaches. Nurses should assess nausea, pain, and distress levels in cancer patients and incorporate complementary therapies into treatment and nursing care. They can also plan activities to reduce physical and emotional symptoms and facilitate chemotherapy adaptation. Training and education on mandala therapy, using simple tools or smartphone applications, can help patients divert their minds and reduce physiological and psychological responses.

### Recommendations

The same study can be conducted (a) with a different population in different settings (b) large sample size (c) among paediatric patients. (d) This can be conducted in primiparous mothers, other long-term illnesses, students or different fields. A comparative study can be conducted between Mandala therapy and other usual relaxation therapies.

### Conclusion

Cancer-related nausea, pain, and discomfort can be reduced using a variety of alternative therapies. The results of the current study indicate that mandala therapy helps lessen nausea, discomfort, and distress in cancer patients undergoing chemotherapy. The therapy should be integrated into the patient's current conventional care because it has such a wide-ranging effect on cancer treatment.

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