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Pain Management In Cancer Patients: Evaluating The Effectiveness Of Non-Pharmacological Interventions

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Abstract

Background:
Cancer pain is one of the most common and distressing symptoms experienced by patients, significantly affecting their quality of life. Although pharmacological management is widely used, it is often associated with adverse effects and may not provide complete relief. Non-pharmacological interventions have emerged as effective complementary approaches for pain management.

Objective:
To evaluate the effectiveness of non-pharmacological interventions in reducing pain among cancer patients.

Methods:
A quantitative, quasi-experimental one-group pre-test post-test study was conducted at **Index Medical College Hospital & Research Centre** among **100 cancer patients** selected using purposive sampling technique. Data were collected using a demographic questionnaire and the Numeric Pain Rating Scale (0–10). Non-pharmacological interventions including deep breathing exercises, relaxation techniques, guided imagery, and music therapy were administered for 5–7 days. Pre-test and post-test pain levels were assessed and analyzed using descriptive and inferential statistics, including paired *t-test*.

Results:
The mean pre-test pain score was **7.2 ± 1.5**, which decreased to **3.8 ± 1.2** in the post-test. The mean difference was **3.4**, and the calculated *t-value* was statistically significant at **$p < 0.05$**. Additionally, the proportion of patients with severe pain decreased from **42% to 12%**, while those with mild pain increased from **12% to 48%** after the intervention.

Conclusion:
The study concluded that non-pharmacological interventions are effective in significantly reducing pain among cancer patients. These interventions are simple, cost-effective, and can be incorporated into routine nursing practice to enhance patient comfort and quality of life.

Keywords: Cancer pain, Non-pharmacological interventions, Pain management, Nursing care, Guided imagery, Music therapy

Introduction

Cancer is a major public health concern and one of the leading causes of morbidity and mortality worldwide. Despite advances in early detection and treatment, cancer continues to impose a significant physical, psychological, and economic burden on individuals and healthcare systems. Among the various symptoms associated with cancer, pain remains one of the most common and distressing experiences reported by patients. It is estimated that approximately 60–80% of cancer patients suffer from moderate to severe pain during the course of their illness, particularly in advanced stages. Unrelieved pain not only affects physical functioning but also leads to emotional distress, anxiety, depression, and a reduced quality of life.

Effective pain management is therefore a fundamental component of comprehensive cancer care. Traditionally, pharmacological therapies such as opioids, non-opioid analgesics, and adjuvant medications have been the cornerstone of cancer pain management. While these medications can provide significant relief, their long-term use is often associated with adverse effects such as nausea, vomiting, constipation, sedation, respiratory depression, and the risk of dependency or tolerance. These limitations highlight the need for complementary and supportive approaches that can enhance pain relief while minimizing side effects.

In recent years, non-pharmacological interventions have gained increasing attention as valuable adjuncts to conventional pain management strategies. These interventions are based on the understanding that pain is a multidimensional experience influenced by physiological, psychological, social, and emotional factors. Non-pharmacological techniques aim to modify pain perception by promoting relaxation, reducing anxiety, improving coping mechanisms, and enhancing overall well-being.

Commonly used non-pharmacological interventions include relaxation techniques, deep breathing exercises, guided imagery, distraction methods, cognitive-behavioral therapy (CBT), massage therapy, and music therapy. These approaches are generally safe, cost-effective, non-invasive, and easy to implement in clinical as well as home settings. Moreover, they empower patients to take an active role in managing their pain, thereby improving their sense of control and self-efficacy.

Given the growing emphasis on holistic and patient-centered care, integrating non-pharmacological interventions into routine oncology practice is highly recommended. However, there is still a need for systematic evaluation of their effectiveness in different clinical settings. Therefore, the present study aims to evaluate the effectiveness of non-pharmacological interventions in reducing pain among cancer patients, thereby contributing to evidence-based nursing practice and improving patient outcomes.

Need for the Study

Cancer pain remains one of the most significant and challenging symptoms experienced by patients across all stages of the disease. Despite advances in medical science and pain management protocols, a large proportion of cancer patients continue to suffer from inadequately controlled pain. Studies indicate that nearly 60–80% of cancer patients experience moderate to severe pain, which negatively impacts their physical functioning, emotional well-being, and overall quality of life. Unrelieved pain can lead to complications such as sleep disturbances, fatigue, anxiety, depression, and decreased ability to perform daily activities.

Pharmacological management, including the use of opioids and analgesics, is the standard approach for cancer pain relief. However, these medications are often associated with undesirable side effects such as nausea, constipation, sedation, respiratory depression, and the risk of tolerance and dependency. Additionally, in some cases, patients may not achieve complete pain relief even with optimal drug therapy. These limitations emphasize the necessity of exploring complementary and alternative approaches to pain management.

Non-pharmacological interventions have emerged as effective adjuncts in reducing pain perception and improving patient comfort. Techniques such as relaxation therapy, guided imagery, music therapy, massage, and cognitive-behavioral strategies are known to influence both psychological and physiological aspects of pain. These interventions are safe, cost-effective, non-invasive, and can be easily administered by nurses as part of routine care.

In the Indian context, especially in resource-limited settings, there is a growing need for simple and economical pain management strategies that can be widely implemented. However, there is limited evidence regarding the effectiveness of structured non-pharmacological interventions among cancer patients in such settings. Furthermore, many healthcare professionals may lack adequate training and awareness regarding the use of these techniques.

Therefore, the present study is undertaken to evaluate the effectiveness of non-pharmacological interventions in managing pain among cancer patients. The findings of this study will help in generating evidence-based practices, enhancing nursing interventions, and ultimately improving the quality of life of cancer patients.

Objectives of the Study

1. To assess the pre-test level of pain among cancer patients.
2. To implement non-pharmacological interventions among cancer patients.
3. To assess the post-test level of pain after administration of non-pharmacological interventions.
4. To compare the pre-test and post-test pain scores among cancer patients.
5. To find the association between post-test pain scores and selected demographic variables (age, gender, type of cancer, duration of illness, etc.).

Hypotheses

Research Hypotheses (H_1)

- **H_{11}:** There will be a significant difference between pre-test and post-test pain scores among cancer patients after the administration of non-pharmacological interventions at $p < 0.05$.
- **H_{12}:** There will be a significant association between post-test pain scores and selected demographic variables at $p < 0.05$.

Null Hypotheses (H_0)

- **H_{01}:** There will be no significant difference between pre-test and post-test pain scores among cancer patients after the administration of non-pharmacological interventions.
- **H_{02}:** There will be no significant association between post-test pain scores and selected demographic variables.

Operational Definitions

1. **Effectiveness**

Refers to the extent to which non-pharmacological interventions reduce the level of pain among cancer patients, as measured by the difference between pre-test and post-test pain scores using a standardized pain scale.

2. **Non-Pharmacological Interventions**

Refers to selected nursing interventions such as deep breathing exercises, relaxation techniques, guided imagery, and music therapy administered to cancer patients for pain relief.

3. **Pain Management**

Refers to the process of assessing, reducing, and controlling pain experienced by cancer patients through non-pharmacological interventions.

4. **Cancer Patients**

Refers to individuals diagnosed with any type of cancer and receiving treatment in the selected hospital.

5. **Pain Level**

Refers to the intensity of pain perceived by cancer patients, measured using the Numeric Pain Rating Scale (0–10).

Materials and Methods

Research Design

A **quasi-experimental one-group pre-test post-test design** was adopted to evaluate the effectiveness of non-pharmacological interventions on pain among cancer patients. This design allows comparison of pain levels before and after the intervention within the same group.

Setting

The study was conducted in a selected tertiary care hospital in **Indore**, which provides comprehensive oncology services, including both inpatient and outpatient care facilities.

Population

The target population comprised cancer patients experiencing pain and receiving treatment in the selected tertiary care hospital in **Indore**.

Sample Size

The study included a total of **100 cancer patients** who met the inclusion criteria.

Sampling Technique

A **purposive sampling technique** was used to select participants based on predefined inclusion and exclusion criteria from the selected hospital in **Indore**.

Inclusion Criteria

- Patients diagnosed with cancer
- Patients experiencing mild to moderate pain
- Patients willing to participate in the study
- Patients aged above 18 years

Exclusion Criteria

- Critically ill patients
- Patients with cognitive impairment
- Patients receiving heavy sedation

Data Collection Tools

The data were collected using the following instruments:

1. **Demographic Variables Questionnaire**

Used to obtain information such as age, gender, education, type of cancer, duration of illness, and treatment modality.

2. **Standardized Pain Assessment Scale**

The **Numeric Pain Rating Scale (NPRS)** was used to assess pain intensity on a scale of 0–10, where 0 indicates no pain and 10 indicates worst possible pain.

Intervention

The following **non-pharmacological interventions** were administered:

- Deep breathing exercises
- Music therapy
- Guided imagery
- Relaxation techniques

These interventions were provided in a structured manner to all participants.

Data Collection Procedure

- **Step 1:** Obtain formal permission from the hospital authority and ethical clearance from the institutional review board.
- **Step 2:** Explain the purpose of the study to participants and obtain informed consent.
- **Step 3:** Conduct **pre-test** using the Numeric Pain Rating Scale to assess baseline pain levels.
- **Step 4:** Administer non-pharmacological interventions daily for a period of **5–7 days**.
- **Step 5:** Conduct **post-test** using the same pain scale to assess changes in pain levels.

Data Analysis

Data were analyzed using both descriptive and inferential statistics:

- **Descriptive Statistics:**

Mean and standard deviation were used to summarize pain scores.

- **Inferential Statistics:**

Paired *t-test* was used to determine the effectiveness of non-pharmacological interventions by comparing pre-test and post-test pain scores.

- The level of significance was set at $\mathbf{p < 0.05}$.

Results

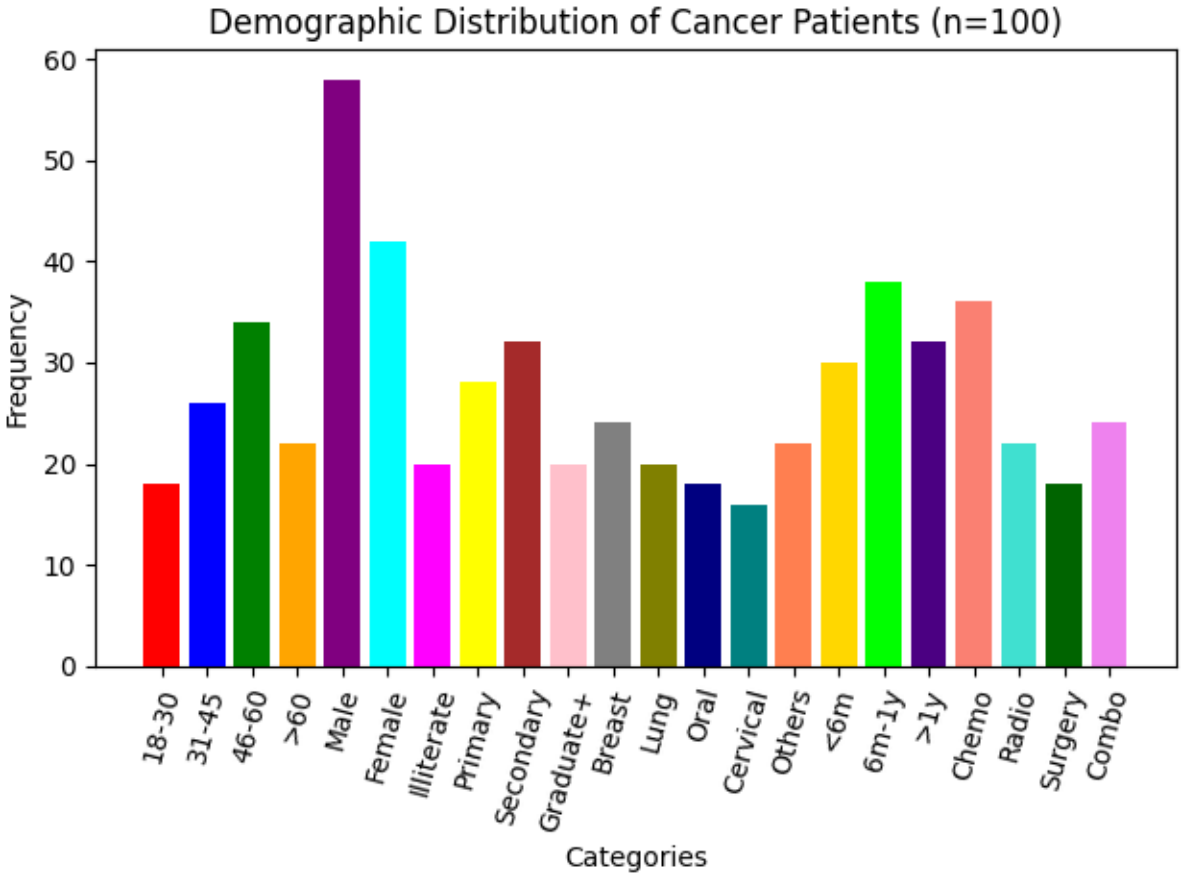
A total of **100 cancer patients** were included in the study to evaluate the effectiveness of non-pharmacological interventions on pain management.

Table 1: Distribution of Participants According to Demographic Variables (n = 100)

S. No.	Variable	Category	Frequency (f)	Percentage (%)
1	Age (years)	18–30	18	18
		31–45	26	26
		46–60	34	34
		> 60	22	22
2	Gender	Male	58	58
		Female	42	42
3	Educational Status	Illiterate	20	20
		Primary	28	28
		Secondary	32	32
		Graduate & above	20	20
4	Type of Cancer	Breast	24	24
		Lung	20	20
		Oral	18	18
		Cervical	16	16
		Others	22	22
5	Duration of Illness	< 6 months	30	30
		6 months–1 year	38	38
		> 1 year	32	32
6	Type of Treatment	Chemotherapy	36	36
		Radiotherapy	22	22
		Surgery	18	18
		Combination	24	24

Description of Table 1

Table 1 shows that the majority of participants (34%) were in the age group of 46–60 years. Most of the participants were male (58%). Regarding education, 32% had secondary education. Breast cancer (24%) was the most common type, and 38% of patients had illness duration of 6 months to 1 year. Chemotherapy (36%) was the most commonly received treatment.



Results: Pain Level Assessment

The effectiveness of non-pharmacological interventions on pain among cancer patients was assessed by comparing pre-test and post-test pain levels using the Numeric Pain Rating Scale (NPRS).

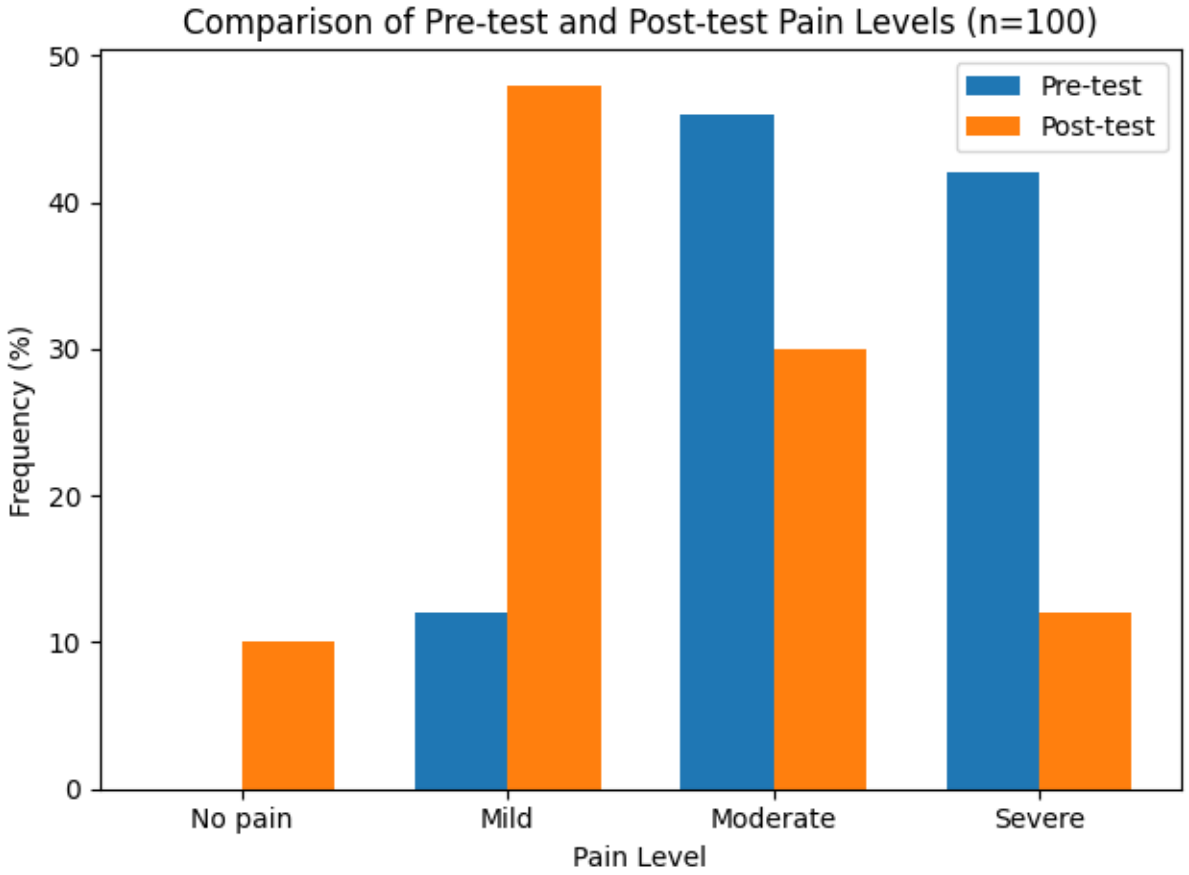
Table 2: Distribution of Pain Levels in Pre-test and Post-test (n = 100)

Pain Level	Score Range	Pre-test f (%)	Post-test f (%)
No pain	0	0 (0%)	10 (10%)
Mild pain	1–3	12 (12%)	48 (48%)
Moderate pain	4–6	46 (46%)	30 (30%)
Severe pain	7–10	42 (42%)	12 (12%)
Total		**100 (100%)**	**100 (100%)**

Description of Table

The above table shows that in the **pre-test**, the majority of patients experienced **moderate (46%) and severe pain (42%)**, with no patients reporting absence of pain.

After the implementation of non-pharmacological interventions, the **post-test results** indicate a significant improvement in pain levels. The proportion of patients with **severe pain decreased from 42% to 12%**, while those experiencing **mild pain increased from 12% to 48%**. Additionally, **10% of patients reported no pain** after the intervention.



Interpretation

These findings clearly demonstrate that **non-pharmacological interventions were effective in reducing the intensity of pain among cancer patients**. There is a noticeable shift from severe and moderate pain categories toward mild and no pain categories in the post-test assessment.

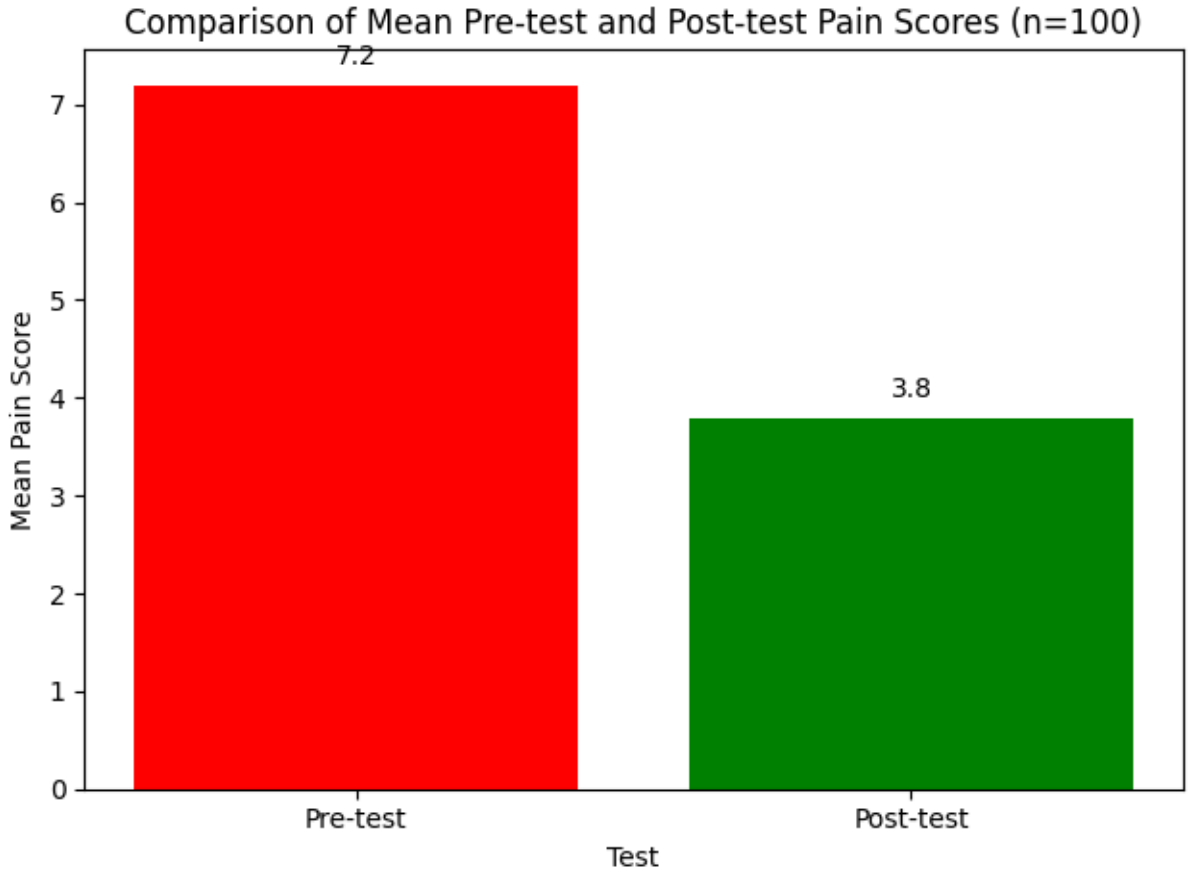
Table 2: Comparison of Pre-test and Post-test Pain Scores (n = 100)

Test	Mean	SD	Mean Difference	t-value
Pre-test	7.2	1.5		
Post-test	3.8	1.2	3.4	Significant*

*Significant at **p < 0.05**

Description of Table 2

Table 2 reveals that the mean pre-test pain score (7.2 ± 1.5) was higher than the mean post-test pain score (3.8 ± 1.2). The mean difference of 3.4 indicates a considerable reduction in pain levels following the intervention. The calculated *t-value* was statistically significant at $p < 0.05$, demonstrating the effectiveness of non-pharmacological interventions.



Overall Findings

The study findings indicate that non-pharmacological interventions such as deep breathing, relaxation techniques, guided imagery, and music therapy significantly reduced pain among cancer patients.

Discussion

The study findings are consistent with previous research indicating that non-pharmacological methods effectively reduce pain intensity and improve patient comfort. These interventions work by decreasing anxiety, enhancing relaxation, and diverting attention from pain.

Conclusion

The study concludes that non-pharmacological interventions are effective in reducing pain among cancer patients. These methods are simple, non-invasive, and can be easily incorporated into routine nursing care.

Recommendations

- Incorporate non-pharmacological therapies into standard cancer care
- Provide training to nurses on these techniques
- Conduct further studies with larger samples and control groups

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