

Effect of Breathing Meditation Technique on Reducing Pain and Anxiety Among Children Undergoing Chemotherapy

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Abstract:

Background: Chemotherapy is the use of medicines to treat cancer or kill cancer cells. But it can result in side effects as pain and anxiety. Breathing meditation technique is used as an effective nonpharmacological treatment to reduce pain and anxiety among children undergoing chemotherapy. **Aim:** This study was aimed to evaluate the effect of breathing meditation technique on reducing pain and anxiety among children undergoing chemotherapy. **Research design:** A quasi-experimental design was utilized to conduct this study. **Setting:** This study was carried out at the Pediatric Oncology Unit in Specialized Pediatric Hospital affiliated to Specialized Medical Centers Secretariat in Benha city. **Subject:** A purposive sample of (60) children undergoing chemotherapy during six months period. **Tools of data collection:** Data was collected through the following tools: **Tool I:** A structured Interviewing Questionnaire. **Tool II:** Observational checklist for implementation breathing meditation technique. **Tool III:** Wong –Baker Faces Pain Rating Scale. **Tool IV:** Beck Anxiety Inventory Scale. **Results:** There was a highly statistical correlation between total practices, pain and anxiety level among studied children pre and post implementation of breathing meditation technique. **Conclusion:** All children who practiced breathing meditation technique experienced a significantly decrease in total pain and anxiety level. **Recommendations:** The breathing meditation technique can be used as a routine nursing intervention for all children with cancer undergoing chemotherapy.

Keywords: Anxiety, Breathing meditation technique, Chemotherapy, Children, Pain.

Introduction:

Cancer is a disease in which some of the body's cells grow out of control and spread to other parts of the body. Cancer in children can occur anywhere in the body including blood and lymph node system, brain, kidneys and other organs and tissues. Childhood cancers may behave very differently from adult cancers. Cancer begins when healthy cells change and grow uncontrollably. In most types of cancer, these cells form a mass called a tumor. A tumor can be cancerous or benign. A cancerous tumor is malignant, meaning it can grow and spread to other parts of the

body. A benign tumor means the tumor can grow but will not spread to distant parts of the body (Haun et al., 2020).

Chemotherapy is the administration of one or more cytotoxic drugs to destroy or inhibit the growth and division of malignant cells in the treatment of cancer. Chemotherapy may be given by mouth, injection, or infusion, or on the skin, depending on the type and stage of the cancer being treated. Chemotherapy may be given alone as a primary treatment or may be used before, after, or in conjunction with

surgery or radiation therapy or biologic therapy (**Borgia, 2023**).

Chemotherapy is a widely use class of drugs that aim to inhibit cell proliferation and tumor multiplication thus avoiding invasion and metastasis. But chemotherapy not just destroy cancer cells but has harm effect on some healthy cells which results in toxic effects of chemotherapy due to the effect on normal cells as well. Inhibition of tumor growth can take place at several levels within the cell and its environment. Children may have a lot of side effects, these side effects depend on the type and amount of chemotherapy and how they react. Some common side effects are mouth sores, fatigue, nausea and vomiting, pain, hair loss and anxiety (**Tong, 2023**).

Pain is an uncomfortable and unpleasant physical sensation. It happens when parts of the body are damaged. Pain may occur for a number of reasons as cancer treatments such as chemotherapy that can damage body tissue and sometimes nerves causing the child to feel pain these are physical causes. Emotions can also affect pain levels such as feelings of anxiety or depression may make pain worse (**Hinds, 2022**).

Some chemotherapy drugs can cause painful side effects such as aching in the muscles and joints, headache and stomach pain. Pain may be felt as burning, numbness, tingling or shooting pains in the hands and feet (called peripheral nerve damage). In children with cancer as a tumor grows, it can press on nerves, bones or organs. The tumor can also release chemicals that can cause pain (**Foxen-Craft, 2023**).

Many children receiving chemotherapy have symptoms of anxiety due to fear of cancer treatment or fear of treatment related side effects such as pain, changes to their bodies or the inability to do their normal activities. Also fear of cancer returning or

spreading after treatment, uncertainty, worry over losing their independence, concern about having relationships change and fear of death aggravate feelings of anxiety (**Fishbein, 2023**).

Emotional and mental health challenges such as depression, stress, and having trouble sleeping trouble associated with chemotherapy can aggravate feelings of anxiety. Anxiety symptoms like restlessness, feelings of worry and dread and sleep problems can interfere with daily life, relationships. But there are Non-pharmacological treatments such as meditation that work best in children`s journey during receiving chemotherapy and help them coping with their symptoms. Meditation is considered one of the easiest ways to reduce pain and anxiety associated with chemotherapy (**Bystritsky, 2023**).

Meditation is a practice in which an individual uses a technique such as mindfulness, or focusing the mind on a particular object, thought, or activity to train attention and awareness and achieve a mentally clear and emotionally calm and stable state. Meditation helps to foster relaxation and heightened awareness in a stressful world where senses often become dull. Meditation may have the potential to improve physical wellbeing as well as emotional health (**Shelly, 2023**).

Breathing meditation is a form of meditation that children can work to reduce pain and anxiety associated with chemotherapy. It is a practice of focusing attention or awareness on their breath. This can help them achieve a sense of well-being in the present moment and reduce anxiety and pain. It can also help them to acknowledge uncomfortable emotions and prevent them from building up. The idea is simply to focus their attention on their breathing, to its natural

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rhythm, flow and the way they feel on each inhale and exhale (**Christon, 2023**).

Breathing meditation technique can give children a sense of calm, peace and balance during the tough times that can benefit both their emotional well-being and overall health. Through meditation children can learn to relax, manage stress and develop a deeper awareness of their bodies, emotions and surroundings by refocusing their attention on something calming such as breathing. Breathing meditation can help them learn to stay centered and keep inner peace (**Komariah, 2023**).

When children are anxious or in pain, their muscles are tightened and breathing becomes shallow. At this time children's body is not getting the amount of oxygen it requires. Breathing deeply and slowly helps lower pain and anxiety in the body. It sends calming signals from the brain to the rest of the body, slowing heart rate and allowing body and mind to become calmer. This help to reduce pain and anxiety among children undergoing chemotherapy (**Beauchamp et al., 2023**).

The nurse plays an important role in caring for children undergoing chemotherapy through rehabilitation of children. The nurse provide care to deal with children's physical, psychological, social, mental and spiritual health. The nurse is caring for child and his family, protecting the child from chemotherapy side effects, teaching the child and his family about chemotherapy protocol. The nurse provide care and help to eliminate pain and anxiety among children and encouraging Non pharmacological treatments as breathing meditation technique that help children to improve quality of life , reduce pain and anxiety associated with chemotherapy (**World Health Organization, 2021**).

Significance of study:

Cancer is the leading cause of death by disease among children in the United States. Approximately one in 285 children is diagnosed with cancer each year. In Egypt, age-standardized incidence rates of cancer are 166.6 per 100 000 children, and 5-years survival of childhood cancer was estimated to be 40% based on baseline assessment of pediatric oncology care in Egypt. Each year, approximately 400 000 children and adolescents are diagnosed with cancer (**Soliman et al., 2020**).

More than 80% of children diagnosed with cancer are cured, and chemotherapy is an effective treatment for childhood cancer as chemotherapy is the first line treatment of cancer but chemotherapy usually causes multiple side effects. Pain and anxiety are common symptoms that affect quality of life in children receiving chemotherapy (**Lam et al., 2019**). Breathing meditation technique is used as an effective non pharmacological treatment to improve quality of life , reduce pain and anxiety associated with chemotherapy .So the current study aimed to evaluate the effect of breathing meditation technique on reducing pain and anxiety among children undergoing chemotherapy.

Aim of the study:

This study aimed to evaluate the effect of breathing meditation technique on reducing pain and anxiety among children undergoing chemotherapy.

Research Hypothesis:

1. Breathing meditation technique will reduce pain and anxiety among children undergoing chemotherapy.
2. The score of pain assessment in post implementation of breathing meditation technique will be decreased than the score of pain assessment pre application of breathing meditation technique.

3. The anxiety level in post implementation of breathing meditation technique will be improved than the anxiety level pre implementation of breathing meditation technique.

Subject and methods

Research design:

A quasi-experimental design was utilized to conduct this study.

Setting:

This study was carried out at the Pediatric Oncology Unit in Specialized Pediatric Hospital affiliated to Specialized Medical Centers Secretariat and Egyptian Ministry of Health and Population in Benha city which located in the 4th floor. It consisted of four rooms. Each room contains four beds and another room for isolation contains one bed.

Subject:

A purposive sample of (60) children undergoing chemotherapy from the above-mentioned setting during six months period from beginning in the study. Under the following inclusion criteria:

Inclusion criteria of children

1. Children from both genders
2. Children in the age group 6-12 years
3. Children undergoing chemotherapy
4. Children accept to participate in the study

Exclusion criteria:

1. Children have intellectual disabilities.
2. Major depression requiring treatment

Tools of data collection:

Data was collected through the following tools:

Tool I: A structured Interviewing Questionnaire: It was developed by the researchers after reviewing the related literature. It was written in Arabic language to suit study sample. It included the following parts:

Part I: Characteristics of studied children, which include (age, gender, residence, child

ranking, educational stage, and number of family members).

Part III: Children knowledge about breathing meditation technique, it developed by the researchers in Arabic language based on (Seaward, 2021) to assess children's knowledge about breathing meditation technique (pre /post implementation of breathing meditation technique) to obtain the data needed, it included (4) **multiple choice questions** about (definition of breathing meditation technique, importance of breathing meditation technique for children undergoing chemotherapy, route of implementation breathing meditation technique, appropriate position while implementation breathing meditation technique).

Scoring system for children's knowledge:

The answers of children were checked with a model key answer, and (2) scores were given for complete correct answer, (1) score for an incomplete correct answer, and (0) score for incorrect answer or unknown.

The total level of children's knowledge was categorized as the following:

- Good knowledge ($\geq 75\%$)
- Average knowledge (50% to $< 75\%$)
- Poor knowledge ($< 50\%$)

Tool II: Observational checklist for implementation breathing meditation technique. It was adapted from (Seaward, 2021) to assess children's practices regarding breathing meditation technique. It was used to teach and train children undergoing chemotherapy how to perform breathing meditation techniques. It consists of eight steps. Each step was checked regarding (Done - Not Done) explaining the technique as: 1) Sitting on a chair in a comfortable position, relaxing neck and shoulders, and closing eyes . 2) Placing one hand on the chest and the other on the abdomen just after the end of the ribs. 3) Imagine that there is a balloon inside

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the abdomen that inflates during inhalation and deflates during exhalation .4) Slowly let the air enter your nose and fill your lungs, feeling the hand on your stomach move upward. 5) Keeping the shoulders completely relaxed, they should not rise during inhalation. 6) Hold each breath for a short period of time and exhale slowly through the mouth while feeling the abdomen return again as if the balloon had been deflated. 7) Focus your attention on the breath and imagine the air surrounding all the pain and anxiety you are feeling in your body. 8) Imagine the pain and anxiety leaving your body while the air coming out of your mouth to feel relaxed.

Scoring system: the total steps of the checklist are eight steps. Each step was checked regarding (Done - Not done), the step that was (done) was given one (1) score and (not done) was given zero(0). The total score of checklists calculated with maximum 8 and minimum zero. The total score of practices was categorized as following:

- Satisfactory practice level $\geq 60\%$
- Unsatisfactory practice level $<60\%$

Tool III: Wong –Baker Faces Pain Rating Scale: It was adopted from (Hockenberry et al., 2015) to assess pain intensity for children undergoing chemotherapy pre and post implementation of breathing meditation technique. This scale combines pictures and numbers for pain ratings. Six faces depict different expressions. Ranging from happy to extremely upset. Each is assigned a numerical rating between 0 (no hurt) and 10 (worst hurt). **FACE 0** did not hurt, **FACE 2** hurts little bite, **FACE 4** hurts a little more, **FACE 6** hurts even more, **FACE 8** hurts more a lot, **FACE 10** hurt worse. The researchers explained the words associated with each face to the child. Then the researchers asked the child to select the facial expression that best described the level of pain he or she was

feeling. The researchers then documented the number corresponding to the word description and face.

Scoring system:

The total score for this scale (0_10). Different levels of pain was calculated as no pain (0), mild (1-3), moderate pain (4-6), severe pain (7-10).

Tool IV: Beck Anxiety Inventory Scale: It was adopted from **Beck, et al. (1988)**, it consists of (21) items to assess anxiety level for children undergoing chemotherapy pre and post implementing breathing meditation technique. It consists of a sum of 21 items each item has score as (0), (1), (2), (3). The different levels of anxiety was calculated as Not at all (0), Mild (1), Moderate (2) and Severe (3). The total score of scale items was (63).

Scoring system

The total score for anxiety was classified as the following:

- Low anxiety from 0-21 score
- Moderate anxiety from 22 -35 score
- Sever anxiety from36 score and above

Tools Validity and Reliability:

Content validity

The study tools was revised by a panel of three experts who are professor in the field of Pediatric Nursing, Faculty of Nursing at Benha University to determine the extent to which the items related to each other, clarity, relevance, comprehensiveness, simplicity and applicability and the necessary modifications were done accordingly reliability performed to confirm validity of the study tools.

Testing reliability

Reliability of the tools was checked by testing its internal consistency using Cronbach's Alpha coefficient test.

- Knowledge reliability statistics Cronbach's alpha =0.917.

- Practice reliability statistics Cronbach's alpha =0.877.
- Anxiety scale reliability statistics Cronbach's alpha =0.625.

Pilot study:

A pilot study was carried out on 10% (6 children) of the total study sample size to ascertain the clarity, relevance, feasibility, applicability of the study tools and sequence of questions to maintain consistency. Also, it helped to estimate the time needed to fill tools of data collection. Based on the results of the pilot study, no modifications were done and subjects under the pilot study were included in the main study sample.

Ethical considerations:

The study was approved by the Scientific research ethical committee at faculty of nursing at Benha university. The researchers explained the aim and nature of the research for each child before their inclusion. Written consent was obtained from children and their parents before participation in this study. The anonymity and confidentiality of the children were secured, and children were informed that the gathered data was used for research purposes only. The study was harmless, and the children were allowed to withdraw from the study at any time freely without explanation of their rationale.

Field work:

The field work begins from August 2022 to the end of January 2023 covering 6 months. The data were collected from the previously mentioned setting according to the policy of the setting. Data was collected three days/week (Saturday, Monday and Wednesday) from 9am-1pm. Before data collection, the researchers introduced herself to both the child and parents, and informed them about the title, purpose of the study, tools components, the study technique, steps and importance of breathing meditation technique to obtain their approval and

cooperation which is needed for conducting this study. The following phases were carried out to achieve the aim of the current study: assessment, planning, implementation and evaluation.

Assessment phase

Data collected before implementing breathing meditation technique. The researchers used tool (I): to assess characteristics of children, Children's knowledge about breathing meditation technique to obtain the needed data before implementing breathing meditation technique. Each child was individually interviewed to obtain the data needed: each interview lasted 20-30 minutes. During this period the researchers observed children's practice for breathing meditation technique using (tool II) pre/post implementation. Also, pain intensity was assessed using tool III, anxiety level was assessed using tool IV. The period of assessment phase (pre- test) took one month (August 2022). An average of 4-6 children were interviewed per/day, 3days weekly, at the previously mentioned setting.

Planning phase

This phase included analysis of assessment phase findings and identification of actual needs for the studied children. Accordingly, the educational booklet was designed by the researchers using simple Arabic language and pictures in order to meet the children's needs and facilitate their understanding.

Implementation phase

The implementation phase lasted for 4 months beginning from (September 2022 till the end of December 2022). Based on the basic assessment the breathing meditation technique was implemented for each child in 4 sessions by using tool II. The total number of children included in the study 60 child. The study group was divided into (10 groups, each group consisted of 6 children. The total

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numbers of sessions were 4 and they were divided into 2 sessions for knowledge and 2 sessions for practice. The time of knowledge sessions ranged from 15-20 minutes. The duration of skill session ranged between 30minutes to 45 minutes according to the children`s understanding and span of attention in form of demonstration and re-demonstration for each group.

Each group attended the following sessions:

First session: it covered the following topics: concept, goals, action, types, rout of administration, side effects of chemotherapy, pain and anxiety associated with chemotherapy.

Second session: covered the following: introduction, elements of meditation and concept, importance, steps, appropriate position of breathing meditation technique, effect of breathing meditation technique on reducing pain and anxiety associated with of chemotherapy.

Third session (practical part) which included (teaching children how to performing breathing meditation technique and performing it).

Fourth session in this session the researchers repeated practical part which included (teaching children how to perform breathing meditation technique and performing it).

Breathing meditation technique

Breathing meditation technique was individually and orally trained to the children. Researchers ensured a noise free in room was used, and quiet well-ventilated environment. During breathing meditation technique if the child becomes agitated or uncomfortable, the researchers stopped the technique. The child must be informed at the beginning that the technique can be stopped at any time. The researchers continued to reinforce the gained information, answered

any raised questions and gave feedback. It was applied in the form of demonstration and re demonstration for each group. Teaching methods were lecture, role play, demonstration and re demonstration. Media utilized were educational booklet, colored pictures, videos. With practice the child can soon perform breathing meditation independently.

Finally, children were asked to do breathing meditation technique then pain, anxiety and physiological parameters were reassessed again after implementation of breathing meditation technique.

Evaluation phase

The evaluation occurred through the assessment phase (pre practicing breathing meditation technique) as pretest and implementation phase (post practicing breathing meditation technique) as posttest by using the study tools to assess the effect of breathing meditation technique on reducing pain and anxiety among children undergoing chemotherapy. (post practicing breathing meditation technique). The period of post- test took one month (from beginning to the end of January 2023).

Statistical analysis:

Statistical analysis was done by using Statistical Package for Social Sciences (SPSS) version 20. Data were collected, revised, organized, coded, tabulated, and analyzed using frequencies, number, percentage, mean scores, standard deviation and correlation coefficient. Data were presented in the form of tables and figures. Quantitative data was presented by mean (\bar{x}) and standard deviation (SD). Qualitative data was presented in the form of frequency distribution tables, numbers and percentages. Qualitative variables were analyzed by Chi- Square test (χ^2) & correlation coefficient (r) to detect the relation between the variables of the study (P-

value). A highly statistical significant level value was considered when ($p < 0.001$). A statistical significant level value was considered when ($p < 0.05$) and no statistical significance difference was considered when ($p > 0.05$).

Results:

Table (1): Shows that, half (50.0%) of studied children aged 6-<8 years with the mean \pm SD 7.51 \pm 2.44. Also, illustrates that more than half (58.3%) of them were male . Regarding their residence, more than two thirds (66.7%) of them lived in rural areas. Regarding child ranking in family more than half (58.4%) of studied children were the second child. Also, more than two thirds (66.7%) of studied children had primary education and their families composed of 3-<6 members.

Figure (1): Illustrates that, more than three quarters (81.7%) of studied children had poor knowledge pre implementation of breathing meditation technique. While more than two thirds (73.3%) of them had good knowledge in post implementation of breathing meditation technique.

Figure (2): Clarifies that, vast majority (95.0%) of the studied children had unsatisfactory practices at pre implementation of breathing meditation technique. While more than three quarters (76.7%) of them had satisfactory practices during breathing meditation technique in post implementation of meditation technique.

Figure (3): Shows that, less than two thirds (65.0%) of the studied children had severe pain at pre implementation of breathing meditation technique, while more than two thirds (66.7%) of them had mild pain at post implementation of breathing meditation technique.

Figure (4): Shows that, less than two thirds (63.3%) of the studied children had severe anxiety level at pre implementation of breathing meditation technique. While more than half (60.0%) of them had mild anxiety level at post implementation of breathing meditation technique.

Table (2): Clarifies that there was a highly statistical correlation between total practices, pain and anxiety level among studied children at pre and post implementation of breathing meditation technique.

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Table (1): Distribution of studied children regarding their personal characteristics (n=60).

Personal characteristics	No.	%
Age/years		
6-<8	30	50.0
8-<10	10	16.7
10-≤ 12	20	33.3
Mean ±SD	7.51±2.44	
Gender		
Male	35	58.3
Female	25	41.7
Residence		
Urban	20	33.3
Rural	40	66.7
Child ranking in family		
First	20	33.3
Second	35	58.4
Third	5	8.3
Educational stage		
Primary	40	66.7
Preparatory	20	33.3
Number of family members		
< 3	0	0
3-< 6	40	66.7
6-7	20	33.3

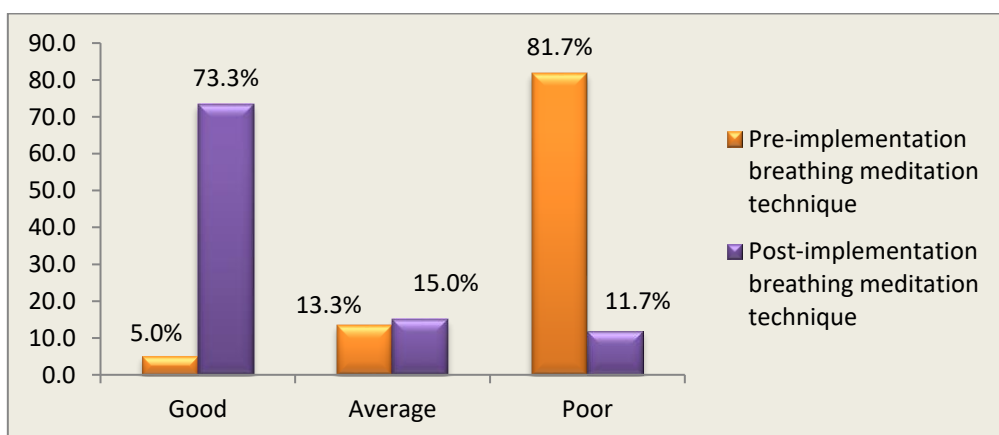


Figure (1): Percentage distribution of studied children regarding their total level of knowledge regarding breathing meditation technique at pre and post implementation of breathing meditation technique (n=60).

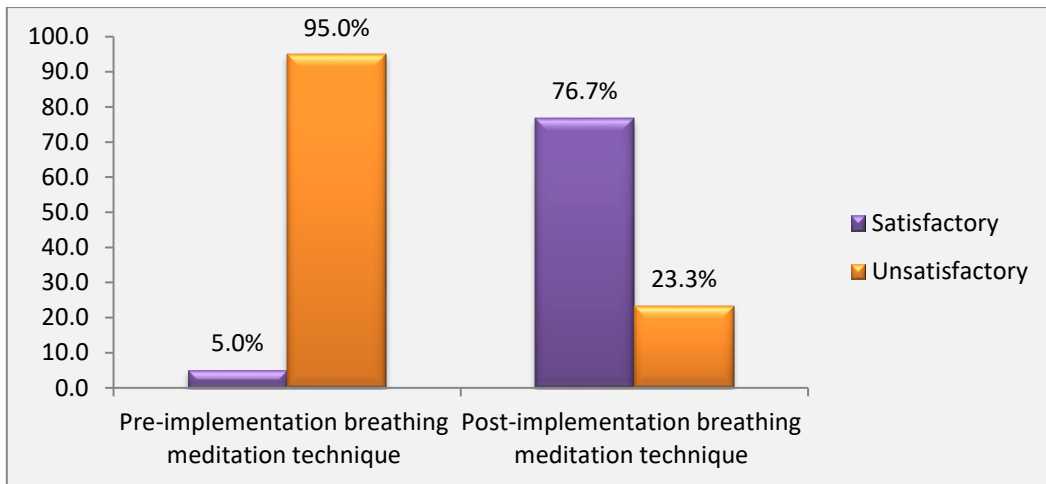


Figure (2): Percentage distribution of studied children total practices level during breathing meditation pre and post implementation of breathing meditation technique (n=60).

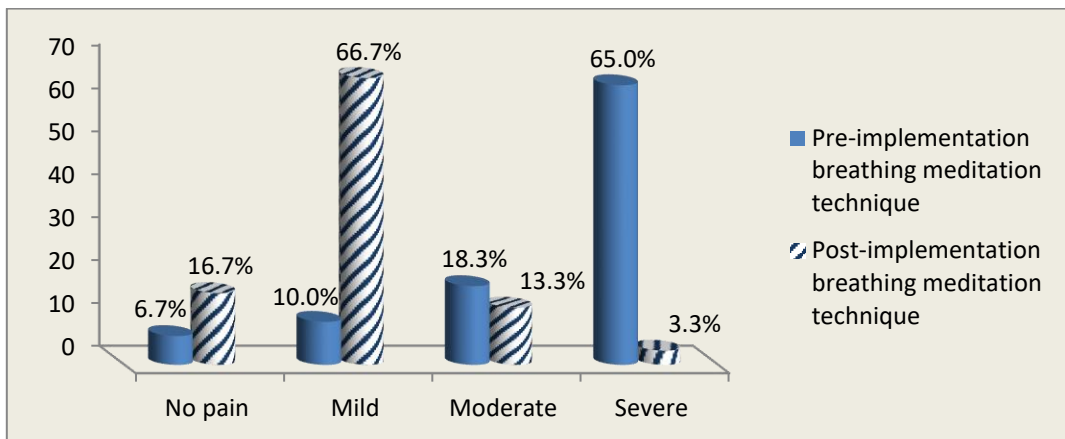


Figure (3): The studied children pain level at pre and post implementation of breathing meditation technique (n=60).

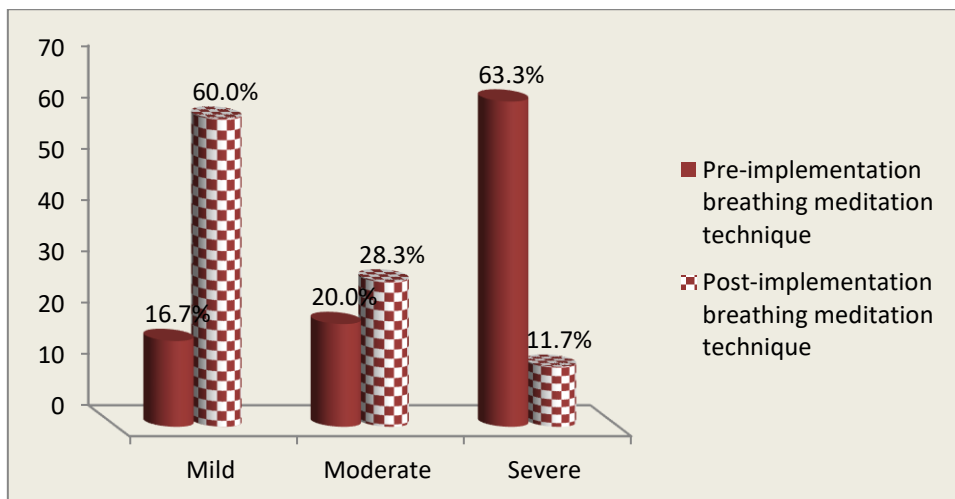


Figure (4): The studied children anxiety level at pre and post implementation of breathing meditation technique (n=60).

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Table (2): Correlation between total practices, pain and anxiety among studied children at pre and post implementation of breathing meditation technique.

Items		Total Pain level		Total anxiety level	
		r	p-value	r	p-value
Pre implementation breathing meditation technique	Total practices	-.201	.123	-.043	.747
Post implementation breathing meditation technique	Total practices	-.722	.000**	-.690	.000**

Discussion

Chemotherapy is likely to be recommended for cancer that has already spread to other areas of the body, for tumors that occur at more than one site, or for tumors that cannot be removed surgically. It is also used when children have recurrent disease after initial treatment with surgery or radiation therapy, but chemotherapeutic drugs have severe side effects. Pain and anxiety are the most common side effects that affect children undergoing chemotherapy. Breathing meditation technique is used as an effective nonpharmacological treatment that is helpful in reducing level of pain and anxiety for children undergoing chemotherapy as it used to calm the mind, balance the emotions, improve mental state, improve awareness, concentration and self-care and improve quality of life (Bystritsky, 2023).

This study illustrated the effect of breathing meditation technique on reducing pain and anxiety among children undergoing chemotherapy. Regarding to the personal characteristics of the studied children the current study showed that, half of studied children aged 6-<8 years with the mean \pm SD 7.51 \pm 2.44. This result was similar to the result of a study by Aney (2020), which entitled "guided imagery and deep breathing: minimizing anxiety experienced by pediatric cancer patients which determined that guided

imagery and deep breathing were effective means for children between the ages of 6- 12 years of age undergoing treatment for cancer.

Regarding to gender of studied children the current study showed that, more than half of them were males. Regarding the residence of studied children, more than two thirds of them lived in rural areas. Also, more than half of them were ranked second child in their families. Meanwhile, more than two thirds of them had primary education. And more than two thirds of studied children family had more than three members.

This result was like the result of a study by Allam et al. (2020), which entitled "effect of distraction technique on pain control for children receiving chemo-radiotherapy" they illustrated that (63.33%) of the studied children were males and (60%) were the second born in birth order. Regarding the educational level of children (66.67%) were in primary school. In relation to family members (66.67%) had \geq 5 members and (70%) were from rural areas and living in a private house.

According to children`s knowledge regarding breathing meditation technique pre and post implementation of breathing meditation technique. The present study illustrated that, there was a highly statistically significant improvement in children`s

knowledge post implementation of breathing meditation technique as compared to pre implementation of breathing meditation technique. According to the researcher's interpretation, it could be due to the impact of the implementation breathing meditation technique using educational booklet on developing the knowledge of the studied children and their adherence to educational booklet as well as, different teaching methods and illustrative media used to deal with children during implementation breathing meditation technique. This result was in line with the result of a study by **Murphy et al. (2022)**, whose research titled "Mindfulness practices for children and adolescents receiving cancer therapies" who illustrated that, the level of children's knowledge is increased after implementation of mindfulness techniques during posttest.

According to children breathing meditation technique practices pre and post implementation of breathing meditation technique this study clarified that vast majority of the studied children had unsatisfactory practices pre implementation of breathing meditation technique while more than three quarters of them had satisfactory practices during breathing meditation technique in post implementation of meditation technique. With a highly statistically significant improvement in children total practices score post implementation of breathing meditation technique as compared with pre implementation.

From the researchers' point of view, the implementation of breathing meditation technique using educational booklet and using demonstration and re demonstration as teaching methods was a successful method to improve children's practices regarding breathing meditation technique and reducing pain and anxiety among studied children undergoing chemotherapy.

This study was in an agreement with the study by **Polk et al. (2023)**, whose research titled "meditation and its applications in mind body problems in children and adolescents" who showed that there was a high significant difference between levels of children's practices pre and post several meditative practices that suggest promising results in the treatment for symptomatic anxiety, depression, and pain in younger populations.

Also, this study in the same line with **Komariah et al. (2023)**, whose research titled "effect of mindfulness breathing meditation on depression, anxiety, and stress" who showed that there was a high significant difference between levels of children's practice pre and post practicing mindfulness breathing meditation that can be a promising strategy to efficiently reduce the levels of stress, depression, and anxiety.

Regarding children pain level the present study illustrated that less than two thirds of the studied children had severe pain at pre implementation of breathing meditation technique, while two thirds of them had mild pain at post implementation of breathing meditation technique. This result was similar to the result of a study by **Ruano et al. (2022)**, whose research titled "psychological and non-pharmacologic treatments for pain in cancer patients". This result suggests that, psychological and non-pharmacological therapies as mindfulness based cognitive therapy, guided imagery and progressive muscle relaxation are effective for reducing pain in pediatric cancer patients. As, there is significantly reduction in levels of pain pre and post implementation of these therapies.

Also, this result was similar to the result of a study by **Amallia et al. (2021)**, whose research titled "music therapy versus deep breathing relaxation to manage stress in children with cancer" which illustrated that, deep breath relaxation which consists of

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meditation and yoga showed reducing at the level of anxiety, tension, pain, and stress.

Regarding children's anxiety level the present study illustrated that more than half the studied children had severe anxiety level at pre implementation of breathing meditation technique. While two thirds of them had mild anxiety level at post implementation of breathing meditation technique. Therefore, there was highly statistically significance difference of the studied children anxiety level at post implementation of breathing meditation technique as compared to pre implementation of breathing meditation technique. These findings were like the result of a study by **Aney, (2020)** which demonstrated that guided imagery and deep breathing were effective means for reducing anxiety that is experienced by children between the ages of 6- 12 years of age undergoing treatment for cancer. This study also, was in agreement with the study by **Komariah et al., (2023)** which illustrated that there is significantly reduction in levels of depression, anxiety, and stress pre and post practicing mindfulness breathing meditation.

Concerning correlation between total practices, pain and anxiety among studied children pre and post implementation of breathing meditation technique. It was found from the present study that there was highly statistically correlation between total practices, pain, anxiety level among studied children pre and post implementation of breathing meditation technique. The researchers believes that the implementation of breathing meditation technique using educational booklet can lead to satisfactory level for practices and knowledge and this has an effect on reducing pain and anxiety among studied children undergoing chemotherapy. These findings in the same line with **Murphy et al . (2022)**, who pointed that, who pointed that mindfulness-based interventions for children with cancer may include mindfulness

movements, mindfulness of the senses, mindfulness of breath, mindfulness of emotions, and the body scan are an emerging therapy that can be incorporated to improve both physical and psychosocial wellbeing for this population.

Conclusion:

According to results of the current study, about two thirds of studied children had severe levels of pain and anxiety at pre implementation of breathing meditation technique. While more than two thirds and more than half of studied children had mild level of pain and anxiety post implementation of breathing meditation technique. As breathing meditation technique is a safe, Non pharmacological intervention and effective technique to reduce the pain intensity and anxiety level for children undergoing chemotherapy.

Recommendations:

- The breathing meditation technique can be used as a routine nursing intervention for all children with cancer undergoing chemotherapy.
- Establishing training program for nurses about skills of breathing meditation technique for children with cancer undergoing chemotherapy to minimize pain intensity, anxiety level to enhance recovery.
- Plan and develop breathing meditation technique for parents and their children undergoing chemotherapy to reach them how to meet their needs.
- Apply this study on large number of children with cancer undergoing chemotherapy to reduce pain and anxiety associated with chemotherapy.

Recommendations for further researchers

- Further studies should be conducted to replicate the study on larger sample of children with cancer undergoing chemotherapy for generalization of results.

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تأثير تقنية التنفس التأملى على تقليل الألم والقلق لدى الأطفال الخاضعين للعلاج الكيميائى

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العلاج الكيميائى هو علاج للسرطان بإستخدام أدوية قوية حيث تعمل هذه الأدوية على قتل الخلايا السرطانية أو إيقاف نموها. ولكن للعلاج الكيميائى آثار جانبية مثل الألم والقلق لذلك يجب تقليل شعور الطفل بهذه الأعراض حتى يتم تلقى العلاج الكيميائى بطريقة فعالة. وتعتبر تقنية التنفس التأملى هى طريقة غير دوائية فعالة عن طريق تمارين التنفس العميق التى تعمل على تقليل شعور الألم والقلق لدى الأطفال الخاضعين للعلاج الكيميائى . لذا هدفت هذه الدراسة إلى تقييم تأثير تقنية التنفس التأملى على تقليل الألم والقلق لدى الأطفال الخاضعين للعلاج الكيميائى. وقد أجريت هذه الدراسة على عينة غرضية من الأطفال الخاضعين للعلاج الكيميائى بقسم الأورام بمستشفى الأطفال التخصصى بمدينة بنها التابعة لأمانة المراكز الطبية المتخصصة بمدينة بنها وعددهم 60 طفل. وقد أوضحت النتائج أنه توجد علاقة ذات دلالة إحصائية عالية بين ممارسات تقنية التنفس التأملى و مستوى الألم والقلق لدى الأطفال الذين تم دراستهم الخاضعين للعلاج الكيميائى قبل وبعد تطبيق تقنية التنفس التأملى. كما أوصت الدراسة بإمكان إستخدام تقنية التنفس التأملى كتدخل تمريضى روتينى لجميع الأطفال المصابين بالسرطان الذين يخضعون للعلاج الكيميائى .