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The Effect of Deep Breathing on Pain, Stress and Depression

A.Bhavani[1], Dr.S.Kalavathi[2]

[1]Ph.D.Scholar, Rani Meyyammai College of Nursing, Annamalai University, Chidambaram, Cuddalore District, Tamil Nadu, India

[2]Professor, Rani Meyyammai College of Nursing, Annamalai University, Chidambaram, Cuddalore District, Tamil Nadu, India

ABSTRACT: A growing number of empirical studies have revealed that deep breathing may trigger body relaxation responses and benefit both physical and mental health. However, the specific benefits of diaphragmatic breathing on mental health remain largely unknown. The present review aim is to rule out the effect of deep breathing on pain, stress and depression.
Keywords: Deep breathing exercise, Stress, Depression

Introduction:

Deep breathing also goes by the names of abdominal breathing, belly breathing, and paced respiration. Deep breathing exercise is the most convenient and can be done anywhere and anytime. Deep breathing actually alters the psychological state, making a painful moment diminish in intensity. Respiration quickens when we are fearful or in great pain. Then take a deep, slow breath and feel the immediate calming effect, reducing both stress and levels of pain. Researchers know that the brain makes its own morphine like pain relievers, called endorphins and enkephalins. These hormones are associated with a happy, positive feeling and can help relay "stop pain" messages throughout our body. During deep breathing, blood is oxygenated, which triggers the release of endorphins (Andrea, 2014). Stress heightens the symptoms of anxiety and depression. Breathing deeply slows down the release of cortisol, a stress hormone and slows down our heart rate (Louisa, 2017). Deep breathing is one of the best ways to lower stress in the body. This is because when the patients breathe deeply, it sends a message to brain to calm down and relax. The brain then sends this message to body as a result increased heart rate, fast breathing, and high blood pressure, all are decreased and body get relaxed (Health wise, 2020), which is why there is a link between stress and breathing, which is why breathing is said to help with Pain, Stress and Depression.

Deep breathing exercise:

- Patient is placed in comfortable position to sit or lie down.
- Instructed the patient to place one hand on stomach right above belly button and the other hand placed in the middle of the chest on top of breastbone.
- Instructed to Take a deep breath, till count 5
- Patient should be able to first feel hand on stomach and then the other hand rise as lungs fill with air.
- Instruct to Hold breath and count 3.
- Exhale slowly through mouth and empty lungs completely by again counting
- Instructed the patient to feel abdomen and chest slowly lower as patient breathes out.
- Instructed the patient to make breaths longer and slower.
- Advised to Continue to inhale and exhale deeply for 5 to 10 minutes
- Instructed to repeat this procedure 3 times a day morning. Afternoon and night after food.

Benefits of Deep Breathing:

- Delivers greater amounts of oxygen more efficiently into the lower lobes of the lungs, rather than only the upper lobes.
- Deep breathing releases carbon dioxide and increases oxygen supply and thus improving blood quality
- Exercises the diaphragm at the base of the lungs, making us more efficient deep breathers over time. Improves flexibility and elasticity of the spine, head, neck and back.
- Lowers the levels of circulating cortisol, a stress hormone, in the body.
- Activates the parasympathetic nervous system, which helps to curb excess stress in the body.
- Slow breathing can increase HRV while reducing the feeling of anxiety asnd depression.
- Increases the production of nitric oxide, an important cellular signaling molecule that functions to expand blood vessels, increase blood flow and protect organs from damage.
- Delivers more oxygen to the cells of the body, including those in the muscles and brain.
- Lowers heart rate and breathing rate.
- Increases alpha brain wave activity, which are brain waves produced during relaxation or meditative states.
- Increases brain wave coherence, which is associated with organized brain function.
- May lead to shorter recovery times and better endurance when utilized consistently.
- Seventy percentage of toxins are released simply by breathing properly, if not the toxins do not get released
- Relieves emotional distress. Clear out negative or confused feelings with a deep breathing
- Releases tension while deep breathed and helps to feel relaxed
- Eases pain. When breathing deeply and holding the breath one can visualize the pain leaving the body as he or she breath out.
- Breathing increases pleasure- inducing chemical in body.

Scientific evidence for the effect of Deep Breathing Exercise on Stress and Depression:

Yusuf Ah, Iswari MF, Sriyono S, Yunitasari E (2020) conducted a quasi experimental study with a pre-post test control group design on the effect of combination of spiritual deep breathing exercise therapy on pain and anxiety among 28 postoperative non-pathological orthopedic fracture patients. The sampling technique used was purposive sampling techniques. The treatment group consisted of 14 respondents and Spiritual deep breathing exercise therapy for pain and anxiety were implemented. The control group also consisted of 14 respondents and the routine care was given. The instrument used was a questionnaire measuring pain level using Numeric Rating Scale and to measure anxiety using the Hamilton Anxiety Rating Scales Questionnaire. Wilcoxon test and the Mann-Whitney test were used to analyze the results of the study. The results showed that there was an effect of a combination of deep breathing exercise spiritual therapy on pain levels (p=0.000) and anxiety levels (p=0.001) in post-operation nonpathological orthopedic fracture patients. The study also concluded that the Spiritual deep breathing exercise therapy has proven to be effective in reducing the level of pain and anxiety in postoperative orthopedic patients so that it can be recommended as a complementary therapy option in the management of postoperative pain that is cheap, easy, and safe.

Atia and Sallam (2020) conducted Quasi-experimental design (one group pretest-posttest design) to evaluate the effectiveness of mindfulness training techniques on stress, anxiety, and depression of depressed patients among 34 depressed patients, selected using purposive sampling techniques. The study area was Psychiatric Hospital in Tanta and The Psychiatric and Addiction Treatment Hospital in Met-Khalf, Menoufia governorate, Egypt. The intervention group was met for eight consecutive weekly sessions that lasted approximately 2 hr. The researcher led the group and the co-leader recorded the sessions. This mindfulness training techniques had a set of specific objectives for each of the 8 sessions. This was achieved through several teaching methods such: Data show, video, pictures, and role play. Demonstration & re-demonstration under researchers' supervision and then the patients apply mindfulness techniques alone. The mindfulness training techniques sessions was 1) Introduction about the concept and nature of mindfulness techniques. 2) Principles and practical instruction for using mindfulness techniques. 3) Mindfulness techniques (body scan, A Three-Minutes Mindfulness, Mindfulness breathing, Mindfulness of thoughts, Mindfulness meditation and Mindfulness eating). Each session focused on mindfulness techniques that could be used in everyday life. One session is lecture on the nature, concept of mindfulness techniques and principles for mindfulness practice provided by the researcher, seven sessions in mindfulness techniques. Data were collected using the depression, anxiety and stress scale (DASS). The study findings revealed that there was an highly statistically significant reduction in stress, anxiety, and depression mean score level among the study group after mindfulness training techniques than before; where p-value (p = 0.001). There was also a statistically significant positive correlation between stress and depression level of study group before and after mindfulness training techniques where p-value (p = 0.015, 0.013), respectively. The study concluded that the implementation of mindfulness training techniques with depressed patients has a positive effect on reducing stress, anxiety, and depression levels

Sunadi, Ifadah and Syarif (2020) conducted a quasi experimental study on the effect of deep breathing relaxation to reduce post operative pain in lower limb fracture among 16 respondents selected by accidental sampling techniques. The respondents were divided into two equal groups as intervention and control group. Pain intensity was measured using numerical rating scale. The study results revealed that deep breathing exercise reduced post operative pain in lower limb fracture ($p<0.05$). the study concluded that deep breathing relaxation is recommended and suggested intervention in reducing post operative pain.

Sasongko, Sukartini, Wahyuni and Putra (2019) conducted a quasi experimental study on the Effects of Combination of Range Motion and Deep Breathing Exercise on Pain at Dr. Soetomo Hospital, Surabaya, East Java among 46 post orthopedic surgery patients who met the inclusion criteria. Purposive sampling techniques were used for sample selection. Pain was assessed using visual analog scale. Range of motion and deep breathing exercises were implemented to the intervention group. The data were analyzed by t-test. The study results showed that after treatment, pain level in the intervention group (mean = 2.43; SD = 1.41) was lower than the control group (mean= 3.48; SD= 1.38) with p= 0.014. The study concluded that combination of range of motion and deep breathing relaxation therapy was effective to reduce pain among post orthopedic surgery patients.

Manpreet, Anii and Kumar (2016) conducted an quasi experimental (two group pre test post test) research design to assess the effectiveness of deep breathing exercises and progressive muscle relaxation technique on stress among 60 amputated patients having stress in selected hospitals of Punjab. Deep breathing exercises and PMRT was provided to experimental group (n=30) twice a day for ten minutes for two weeks and conventional treatment for control group (n=30). Data collection were done using Modified Perceived Stress Scale (PSS) and Socio demographic data sheet. The study results showed that there was significant difference in stress score after two weeks of deep breathing exercises and PMRT in experimental group (p value 0.026) as compared to control group. Stress also had significant relationship with age, marital status, educational status, cause of amputation, site of amputation.

D'silva , Vinay and Muninarayanappa (2014) conducted an randomized control design on effectiveness of deep breathing exercise (DBE) on the heart rate variability, BP, anxiety & depression among 45 patients with coronary artery disease. The study explore the anxiety and depression status of patients with coronary artery disease and evaluated the effect of deep breathing exercise on psychosocial variables as well as physiological variables like heart rate variability and blood pressure. Participants were trained in Deep breathing exercise (DBE) for 2-3 days, were instructed to practice the exercise twice a day for 10 min for a period of 2 weeks, further instructed to come for follow up to cardiac OPD after 2 weeks. The study results revealed that majority of the participants were anxious 39 (86.66%), 23(57.5%) had mild depression and 3(7.5%) were with severe depression. Fischer's exact test revealed that there was significant association between depression and occupation (p=0.051), monthly income (p=0.031) and co morbid disease (p=0.006, p<0.05). Analysis were done by Karl Pearson's correlation coefficient, showed there was an significant positive correlation between anxiety and depression i.e. (r = 0.414, p <0.01). The study concluded that DBE was found to be effective in reducing anxiety and diastolic BP of clients with CAD. But there was no significant reduction in HR, SBP and depression after the intervention.

Conclusion:

Deep Breathing Exercise is the great way to help with pain, stress and depression management by reducing its effect in body and mind. It also helps to cope with everyday various health problems.

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