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DIFFERENCE BETWEEN *PURSED LIP BREATHING* AND *DISTRACTIVE AUDITORY STIMULI* REGARDING ANXIETY IN COPD PATIENTS

L. Gita Aryumi Sejati, Dyah Restuning Prihati, Wijanarko Heru Pramono

Widya Husada University Semarang

E-mail correspondence: dyah.erpe@gmail.com

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ABSTRACT

Anxiety of COPD patients is related to perceived clinical depression such as fear of acute dyspnea attacks with a sense of suffocation and fear of death. Anxiety can be treated by providing non-pharmacological therapies, namely *Pursed lip breathing* and *distractive auditory stimuli. Pursed lip breathing* is a breathing technique that helps more effectively in increasing oxygen saturation, which trains to exhale more slowly so that breathing will feel easy and more comfortable both when resting or doing activities. *Distractive auditory stimuli (DAS)* using classical music with a tempo of 60-80 beats/minute so as to increase patient calmness and control patient breathing patterns. This study was conducted to determine the difference between *Pursed lip breathing* and *distractive auditory stimuli* on the anxiety of COPD patients. Experimental research method *two group pre-posttest design* with 40 respondents taken using *purposive sampling technique* which each group consists of 20 respondents. Anxiety measurement tools using *beck anxiety inventory.* Bivariate analysis using man-whitney *test* . The results showed that the p-value of the Mann-Whitney test was 0.006. Conclusion: there is a difference in *Pursed lip breathing* and *distractive auditory stimuli*, indicating a decrease in the anxiety level of COPD patients.

Keywords: Anxiety, COPD, Distractive Auditory Stimuli, Pursed lip breathing

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a common disease with symptoms of persistent airflow limitation associated with a more chronic inflammatory response in the respiratory tract and lung parenchyma due to harmful gases or particles (Yudhawati & Prasetiyo, 2018). Gender, age, body index, and smoking habits are risk factors for COPD. COPD is a non-communicable disease where the manifestation of this disease is often coughing, but it's not just an ordinary cough, this disease can threaten life and result in death (Nurfitriani, 2021).

COPD in Central Java had 41,049 COPD cases in 2019, 43,182 in 2020, 42,1123 in 2021, and 57,502 in 2022 (Dinas Kesehatan Provinsi Jawa Tengah, 2023). A diagnosis of COPD should be considered in any patient who complains of shortness of breath, chronic cough or sputum production, and a history of recurrent lower respiratory tract infections (Agustí et al., 2023). The results of a preliminary study with interviews with 5 COPD patients stated that 3 people felt anxious because their condition when they were short of breath felt like they were suffocating. All the patient did was sit and stroke their chest until they calmed down. Two other people stated that they were never worried about their situation. COPD patients who are hospitalized are usually patients who have experienced severe exacerbations. These patients were reported to have higher anxiety compared to outpatient COPD sufferers. This anxiety occurs due to traumatic experiences due to shortness of breath, and chronic cough which causes fear and worry about oneself because of the disease (Radityatami, 2018). This is reinforced by the statement that anxiety in COPD patients is related to clinical depression, such as fear of acute dyspnea attacks with a feeling of suffocation and fear of death (Tselebis et al., 2016). COPD patients with comorbid anxiety or depression experience more acute exacerbations and incidence of rehospitalization within 12 months. They also have a higher risk of death than COPD patients without these comorbidities (Rahi et al., 2023).

COPD patients often experience anxiety, which is estimated to occur in around 2-96%. The anxiety symptoms experienced are related to lack of physical activity, worsening dyspnea, increased frequency of exacerbations, and exposure to cigarette smoke (Sandra et al., 2022). Anxiety can cause shortness of breath. Shortness of breath and other physical symptoms that accompany anxiety are a "fight or flight" response to protect yourself. This response can cause the chest to tighten, breathing more quickly, and shortness of breath because the body is trying to get more oxygen to the muscles. Anxiety in COPD patients can be treated by providing non-pharmacological therapy. This non-pharmacological therapy can reduce the side effects of pharmacological therapy. Therapy that is easy to do independently is Pursed lip breathing, which is a breathing technique that helps to increase oxygen saturation more effectively, where you train to exhale more slowly so that breathing feels easier and more comfortable both when resting or doing activities (Suryantoro, Isworo, & Upoyo, 2017). In the process, the Pursed lip breathing technique can

expand the lungs more optimally and prevent respiratory muscle fatigue, so that COPD sufferers achieve controlled, efficient ventilation and reduce the work of breathing (Junaidin, Syam, & Irwan, 2019). Pursed lip breathing is carried out to obtain controlled and efficient ventilation results, besides being able to increase alveolar inflation maximize muscle relaxation, and reduce the work of breathing (Tunik, Niningasih, & Yuswantoro, 2020). Results of research conducted by (Haryanti, Suratun, & Wahyudi, 2023) stated that Pursed lip breathing (PLB) is effective in reducing dyspnea by administering it for 4 weeks 3 times a day for 10-30 minutes in a row.

Pursed lip breathing can help improve breathing frequency. When anxious, a person will experience rapid breathing because of the anxiety they feel. When Pursed lip breathing is done, there is an improvement in homeostasis, namely a decrease in carbon dioxide levels in the blood when taking a long breath during inhalation, so that carbon dioxide becomes normal, this has an impact on the breathing pattern being good. Pursed lip breathing can affect breathing frequency. If it is done for a long duration of practice with the correct process, the results will be better (Suryati, Primal, & Sy, 2018). Apart from that, when you breathe with your mouth with a long exhalation, it can increase the pressure in the oral cavity and increase the intratracheal pressure, causing a decrease in air trapping in the lungs, which makes the hypothalamus release the CRF hormone from the pituitary gland so that the body relaxes (Novitasari, Wati, & Weti, 2022).

Another therapy to overcome anxiety is Distracting auditory stimuli (DAS). Distractive auditory stimulation (DAS) in anxiety (DAS) is distractive auditory stimulation in the form of music which can reduce the perception of dyspnea. Distractive auditory stimulation (DAS) can use classical music with a tempo of 60-80 beats/minute so that it can increase the patient's calmness and control the patient's breathing pattern (Rozi, 2019). Distractive auditory stimuli use the sense of hearing in the process, when music comes in and is distributed as sound waves, this increases endorphin hormones which affect mood (Keumalahayati & Supriyanti, 2018). Anxiety after being given music therapy is because music stimulates the axons of accessory sensory fibers to the neurons of the reticular activating system. This stimulus is transmitted by nuclei from the thalamus through the cerebral cortex area, systemic limbic and neuroendocrine systems and music will reduce oxygen consumption, music also reduces levels of adrenal corticosteroids, Corticotrophin Releasing Hormone (CRH) and Adrenocorticotropic Hormone (ACTH). The impact is reduced stress and feeling comfortable (Kustiningsih, 2020).

Music therapy is effective in reducing stress and anxiety, where listening to music that is calm, melodious, and follows a stable rhythm will cause the production of endorphin and melatonin hormones which are responsible for producing a feeling of comfort and relaxation. Music can also divert people's attention from stress and anxiety, and focus more on positive things (Khadijah, 2023). Music can increase the release of endorphin hormones, where these hormones provide a feeling of relaxation and calm, the midbrain releases gamma amino butyric acid which is useful for inhibiting the transmission of electrical impulses from one neuron to another by neurotransmitters. Music can reduce anxiety where there is a correlation with the nerves of the process and perception of listening to music. Musical stimulation can activate specific pathways in areas of the brain, one of which is the limbic system which is activated and causes a feeling of relaxation. Matching the rhythm of the body and the rhythm of the music will cause a harmonious response in the body, if the rhythm is appropriate it will create a pleasant impression.

Based on this, it is necessary to further study the effect of each method with certain therapies that are focused on reducing anxiety in COPD patients. Therefore, the author feels the need to analyze the difference between *Pursed lip breathing* and *disruptive auditory stimulation* on the anxiety of COPD patients.

METHODS

This type of research is quantitative using quasi-experimental. The sample for this study consisted of 40 COPD patients who were hospitalized in hospitals in Salatiga. The study's inclusion criteria were respondents experiencing anxiety, and compliments, apart from that the exclusion criteria in this study were patients with heart failure, hearing loss, and oxygen saturation less than 95%. Research time from March until April 2023. Scale The Beck Anxiety Inventory (BAI), developed by Aaron Beck, is an anxiety measurement scale with 21 questions with emotional, cognitive, and physical aspects. Beck Anxiety Inventory (BAI) has 0.379 – 0.807 > r table 0.254 with a Cronbach alpha value of 0.756.

In group 1 with 20 respondents, the researcher provided intervention Pursed lip breathing (PLB) is given 2 times a day with 5 repetitions in one intervention with a duration of 7 minutes at 09.00 and 15.00 WIB. Implementation of the intervention for 3 days. In the second group with 20 respondents, the researcher provided Distractive auditory stimuli (DAS) intervention which was listened to via earphones from a cellphone and was carried out twice a day for 30 minutes at 09.00 and 15.00 WIB for 3 consecutive days. Researchers measured anxiety using the Beck Anxiety Inventory (BAI) questionnaire before intervention and after intervention to respondents. The analysis uses the Man-Whitney test with a significance value of $\alpha = 0.05$. This research has been subjected to ethical test number 76 /EC- LPPM /UWHS /X-2023.

RESULTS AND DISCUSSION

Table 1. Differences between *Pursed lip breathing* and *Distractive Auditory Stimuli* on the Anxiety of COPD Patients

	Negative Ranks	Positive Ranks	Ties	n	*p*-Value
Pursed lip breathing	19	0	1	20	0,006
Distractive auditory stimuli	16	0	4	20	

Table 1 shows the negative rank value in 19 respondents and the ties value in 1 respondent, meaning that there is a decrease in anxiety scores between pretest and posttest, and 1 respondent has the same score between pretest and posttest, this shows that there is an effect on the anxiety level of COPD patients before and after being given *Pursed lip breathing*. The results showed a negative rank value in 16 respondents and a ties value in 4 respondents, meaning that there was a decrease in anxiety scores between pretest and posttest, and 4 respondents had the same score between pretest and posttest, this shows that there is an effect on the anxiety level of COPD patients before and after being given *distractive auditory stimuli*. The *p-value* of the *Mann U Whitney* test obtained at 0.006 is less than α (0.05), indicating that there is a difference in *Pursed lip breathing* and *distractive auditory stimuli* on the anxiety of COPD patients.

Anxiety experienced by respondents due to symptoms of COPD such as dyspnea and continuous coughing which causes disrupted activities, this causes anxiety in respondents. Anxiety in COPD arises because of a negative assessment due to threats in the surrounding environment and the treatment undergone (Radityatami, 2018). The anxiety felt by respondents after doing PLB decreased anxiety because they felt relaxed after doing Pursed lip breathing. When someone feels anxious, the response that will occur in the body, namely breathing, pulse, and blood pressure, will increase, appearing tense and restless. Pursed lip breathing helps to provide and balance oxygen in the body, thereby causing the body to relax. This condition is continued to the hypothalamus with corticotropin-releasing factor (CRF) which stimulates the brain to increase production (POMC), when the production of encephalin and the adrenal medulla increases, at that time the beta-endorphin proopiomelanocortin produced as a neurotransmitter that influences mood (Karim, Aini, & Azzahra, 2022).

In this study, respondents' anxiety decreased after the intervention of *distractive auditory stimuli,* where researchers used beethoven classical music performed for 3 days with a span of 30 minutes to reduce respondents' anxiety. This anxiety decreases due to a sense of relaxation after listening to music. The results of this study are supported by where in his research the results obtained that there is an effect of Beethoven classical music therapy on reducing anxiety in patients with chronic renal failure (Lina, Susanti, Nunik, Wahyu, & Efrisnal, 2020).

According to the researcher's assumption, differences in anxiety among respondents are not only due to the therapy given but can be influenced by each respondent's characteristics and the therapy given, apart from that in the Pursed lip breathing process for each respondent, if you don't do it correctly this can cause anxiety. become less effective. When providing distractive auditory stimuli therapy, each respondent was given the same music with the same volume and rhythm, but the auditory response of each respondent was different, whereas in this study the majority were elderly.

These results are supported by research showed that there was a significant improvement after Pursed lip breathing with symptoms of shortness of breath and anxiety in COPD where there was an increase in temperature, heart rate, blood pressure, and respiratory rate (Mohamed, 2019). The results showed that there was a significant improvement after Pursed lip breathing with symptoms of shortness of breath and anxiety in COPD where there was an increase in temperature, heart rate, blood pressure, and respiratory rate. This was also supported by (Sakhaei, Sadagheyani, Zinalpoor, Markani, & Motaarefi, 2018) where Pursed lip breathing has a good impact on oxygenation, reducing heart rate and this decrease is due to stimulation of the autonomic nervous system and parasympathetic activity, stimulation of the vagus nerve can cause relaxation. Breathing exercises can reduce dyspnea and anxiety, where breathing through the nose and pursing the lips and in the Fowler's position with the head resting and elevated 60 degrees can reduce shortness of breath and anxiety from the first 40 minutes of arrival at the ER and results can be seen 4 hours later (Srimookda, Saensom, Mitsungnern, Kotruchin, & Ruaisungnoen, 2021)

Research (Hanedan Uslu, 2017) states that there is an influence of music on reducing anxiety, where music influences physiological and psychological factors, there is an effect that triggers the release of hormones that change body temperature which affects pulse rate, breathing, and blood circulation. This will be more positive if individuals are faced with a choice of their favorite music. Apart from that, there is also research (Hakim, Kaldozkhi, Tashakori, & Ghanbari, 2023) stating that listening to music can reduce anxiety and lower vital signs, where music is given for 20 minutes and after the second and third anxiety scores decrease, music can reduce unpleasant feelings by activating several subcortical areas of the brain including the dopaminergic system in the middle of the brain. The classical music

used by researchers helps reduce respondents' anxiety, (Mahatidanar & Nisa, 2018) Classical music is the basis of order and is both fair and beautiful. Apart from that, the sounds, melodies, rhythms, and harmonies expressed in sounds can stabilize emotions, relieve stress and improve mood. Beethoven's classical music therapy can reduce anxiety, where the presence of classical music can respond to controlling the activity of the autonomic nervous system such as reducing respiratory frequency, pulse, muscle tension, and blood pressure (Elyonasari, Suharman, Evayanti, & Yuviska, 2021).

This study found a difference in Pursed lip breathing and *distractive auditory stimuli* on the anxiety of COPD patients with the results of 19 respondents experiencing a decrease after being given *Pursed lip breathing* and 16 respondents experiencing a decrease in anxiety scores after being given *distractive auditory stimuli*.The *Pursed lip breathing* intervention is more effective in reducing the anxiety of COPD patients.

CONCLUSION AND SUGGESTION

The results showed a difference in *Pursed lip breathing* and *distractive auditory stimuli* on the anxiety of COPD patients with a *p-value* of 0.006. The *Pursed lip breathing* intervention is more effective in reducing the anxiety of COPD patients. The results of this study can be used as *evidence based in* conducting interventions and standard operating procedures in COPD patients who experience anxiety.

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