Available online at: http://e-jurnal.lppmunsera.org/index.php/parahita
Wikrama Parahita: Jurnal Pengabdian Masyarakat
p-ISSN 2599-0020, e-ISSN 2599-0012

Box Breathing: Education and Training to Reduce Respiratory Complaints in Tunggul Irang Ilir Village

Muhlisoh[1]*, Asni Hasaini[2], Martini Nur Sukmawaty[2]
[1]Department of Ners Profession, Sekolah Tinggi Ilmu Kesehatan Intan Martapura, Jl. Samadi No. 01 Kel. Jawa, Martapura, South Kalimantan 71213, Indonesia
[2]Department Nursing, Sekolah Tinggi Ilmu Kesehatan Intan Martapura, Jl. Samadi No. 01 Kel. Jawa, Martapura, South Kalimantan 71213, Indonesia

Article Information

Article history

Received: July 10, 2025
Revised: November 17, 2025
Accepted: November 21, 2025

Keywords: Box Breathing; Education; Training

Abstract

The prevalence of respiratory infections in South Kalimantan Province has increased to 189,111 cases throughout 2023. Preliminary Research indicates that 2 out of 3 Posyandu participants interviewed reported experiencing coughs and colds, leading to respiratory problems. The increase in ARI cases underscores the crucial role of the community in both promoting and preventing them. The goal of this activity is to empower the community by increasing their knowledge and skills in applying box breathing techniques to reduce mild respiratory symptoms. The strategy to achieve health involves improving the quality of health services, one of which is promoting box breathing to reduce complaints among people with respiratory disorders. This will be carried out through education to increase understanding. The purpose of promoting and counseling is to reduce complaints among people with respiratory disorders. The results showed an increase in knowledge after the promotion of box breathing was carried out among the residents of Tunggul Irang Ilir Village(Pre: less than satisfactory 68,2%; Post: good 81,2%).

*Corresponding Author

Muhlisoh
E-mail: muhlisoh.30@gmail.com

INTRODUCTION

Acute respiratory infections (ARI), including upper and lower respiratory tract infections, are characterized by symptoms such as cough, fever, nasal congestion, and respiratory failure. These infections remain a public health priority due to their potential to cause substantial mortality and morbidity worldwide (Ross et al., 2023; Vos et al., 2020). Each year, there is a significant burden of endemic respiratory disease, accounting for approximately 4% of life years and resulting in 2.5 million deaths in 2019 due to ARI (Ross et al., 2023). Respiratory distress is a common symptom of respiratory infections. The prevalence of respiratory diseases in South Kalimantan Province surged to 189,111 cases throughout 2023. The highest prevalence occurred in three districts/cities, including Banjar Regency, with 26,237 cases. A brief interview with three villagers revealed that two of them reported experiencing coughs, colds, and respiratory problems. One technique to reduce respiratory symptoms in respiratory disorders is deep breathing exercises. According to Research, box breathing can improve respiratory rate (Muhlisoh et al., 2024).

Breathing is a vital bodily function that facilitates the exchange of oxygen and the removal of carbon dioxide. Although the neurobiology of breathing has been studied in both animals and humans, there is little comparative data on the effects of various breathing techniques or the amount of breathing exercise required to produce these effects (Betka et al., 2022; Hasaini et al., 2024).

With each breath, muscles contract, articulations move, intrathoracic and abdominal pressures change, the bronchial tree and lung parenchyma are stretched or compressed, air flows through the upper and lower airways, and cardiac preload and afterload vary. Furthermore, the overall outcome of respiratory activity in terms of gas exchange is integrated by peripheral and central chemoreceptors sensitive to changes in blood O2 and CO2 (Balban et al., 2023).

Breathing pattern and depth have a direct physiological relationship that affects oxygenation,

DOI: https://dx.doi.org/10.30656/jpmwp.v9i2.11052

heart rate, ventilation, and blood pressure. Slow breathing at six breaths per minute reduces the chemoreceptor reflex response to hypercapnia and hypoxia compared with spontaneous breathing at 15 breaths per minute (Bussa-Carlson et al., 2024).

One key distinction between standard breathing techniques is the emphasis on the relative duration and intensity of inhalation versus exhalation. Box breathing, or "tactical breathing," involves an equal ratio of inhalation to exhalation and has been used by military personnel for stress management and performance enhancement (Ahmed et al., 2021).

BB is a slow, rhythmic breathing technique widely used by athletes and professional workers. This technique, also known as square breathing, is easy to practice: inhale for 4 seconds, hold for 4 seconds, exhale for 4 seconds, and hold for 4 seconds. This technique improves performance and concentration, and reduces stress levels (Ahmed et al., 2021).

The partner group's problems, based on interviews and on-site surveys, were that some residents frequently complained of respiratory symptoms, some experienced respiratory illnesses, and the community relied primarily on pharmacological management due to a lack of knowledge about self-administered interventions.

The solution offered to the group or partner's problems was to help solve the problem by identifying community knowledge regarding preventive measures for handling shortness of breath, promoting preventive measures: by requesting permission from the local government, providing time for outreach, providing education on respiratory disorders and independent box breathing interventions, demonstrating independent box breathing interventions, and collaborating with village health cadres to promote and educate. The community service activity conducted was the result of a research development that found box breathing to have a positive effect on the respiratory rate of patients with pneumonia (Muhlisoh et al., 2024).

The partners' contributions to this community service included granting permission and providing time for residents to conduct outreach, providing a space for residents to gather while maintaining social distancing to allow simultaneous outreach, and assisting with data on complaints experienced by Tunggul Irang residents. This community service activity aimed to introduce and promote box breathing techniques as a non-pharmacological intervention to reduce respiratory complaints. Therefore, this program aimed to enhance their knowledge and skills through educational videos and demonstrations of box breathing techniques. The contribution of the community service activity carried out is expected to enable partners and the community to enhance their understanding and skills in applying complementary techniques to reduce respiratory discomfort.

MATERIALS AND METHODS

Materials

The community service method was developed to address the problems of the Tunggul Irang Ilir Village community partners. The activities included education and training on BB techniques to reduce respiratory complaints. The tools used included demonstration videos, posters, projectors, loudspeakers, and questionnaires.

Methods

This community service employed an educational intervention with a pre–post design to assess participants' improvement in respiratory management knowledge. The method was designed to address partner issues through education and training on box breathing to reduce respiratory complaints in Tunggul Irang Ilir Village. The community service phase began with planning, which included conducting a preliminary study and developing a community service proposal, which two reviewers reviewed on September 13, 2024. After the team received permission from the Puskesmas Martapura 1 to conduct activities in its work area in February 2025. The program consisted of three stages: (1) Planning, including a preliminary study, proposal development, and obtaining permission from the Martapura 1 Health Center; (2) Implementation, involving pre–post testing, video- and flipchart-based education, live demonstration, and discussion sessions; and (3) Evaluation, which included post-test assessments and follow-up monitoring by community health cadres to observe the application of box breathing practices.

RESULTS AND DISCUSSION

Table 1 reveals significant demographic data about the village residents engaged in community service. The majority (72.73%) fall within the Early Older Adulthood category (46-55 years), with a notable 68.18% being female, 68.18% having an elementary school education, and 77.27% being employed.

Acute respiratory infections (ARIs) such as flu, pneumonia, influenza, coronavirus disease 2019 (COVID-19), and bronchitis are pervasive and significant contributors to the global disease burden and mortality. ARI, the fourth leading cause of death and disability for children and adults worldwide, is a pressing public health concern (Nieman & Sakaguchi, 2022). One effective technique for clients with respiratory disorders is breathing exercises. These exercises, which include inspiratory muscle training, expiratory muscle training, diaphragmatic breathing, Liuzijue, and combined exercises, have been shown

DOI: https://dx.doi.org/10.30656/jpmwp.v9i2.11052

to improve lung function and enhance quality of life significantly (Pearkao et al., 2025; Yun et al., 2021).

Table 1. Characteristics of Village residents and health cadre

Variable	Resident		Health Cadre	
	F	%	f	%
Ages				
Late dolescence (17-25 years)	0	0	2	25
Early Adulthood (26-35 years)	0	0	3	37,5
Late Adulthood (36-45 years)	1	4.54	3	37,5
Early Older Adulthood (46-55 years)	16	72.73	0	0
Late Older Adulthood (55-65 years)	5	22.73	0	0
Total	22	100	8	100
Gender				
Male	7	31.82	0	0
Female	15	68.18	8	100
Total	22	100	8	100
Level of education				
Elementary school	15	68,18	0	0
Junior high school	3	13.64	0	0
High school	2	9.09	4	50
College	2	9.09	4	50
Total	22	100	8	100
Employment				
yes	17	22,73	2	25
no	5	77.27	6	75
Total	22	100	8	100

Before the implementation stage, residents and health cadres were given a 10-question pretest. The pretest lasted 15 minutes, and based on the results, the community service provider, a trusted and knowledgeable resource, delivered the material. The presentation of the material using leaflets lasted 25 minutes (Fig. 1).

The results of the study showed a significant increase in community understanding. Before the educational activities, the community was in the less-than-satisfactory category (68.2%), and the health cadres were in the satisfactory category (62.5%). However, after the educational activities, the community's understanding improved to the good category (81.8%), and the health cadres also moved to the good category (62.5%), as depicted in Figure 3. This improvement can be attributed to the direct delivery of education and the active community service, which played a vital role in facilitating effective two-way communication. In addition to providing materials to residents, community service officers also provided materials to health cadres, teaching them how to calculate respiratory rates. The next step involves conducting monitoring and evaluation by providing a post-test to measure the community's understanding of the material.

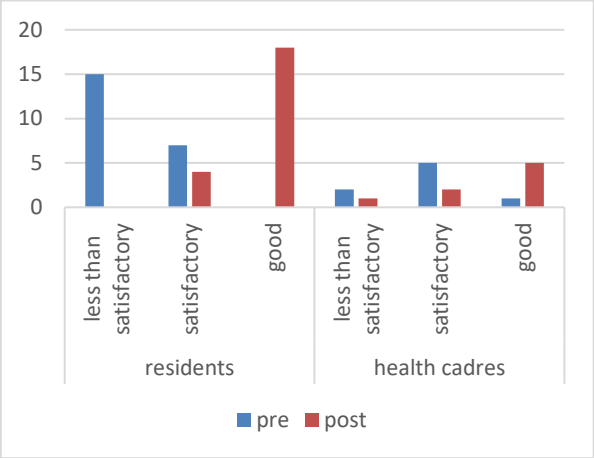

Fig 1. Results of the evaluation of residents and health cadres' understanding before and after the education and training intervention

Education is a powerful determinant of health, resilience, and life satisfaction, highlighting the necessity of interventions that promote health and education (O'Malley et al., 2025). Strategies for enhancing health education in communities should focus on ensuring the credibility of health education content, promoting equitable access to health resources, and developing tailored educational materials. It's crucial to understand that effective public health education must be tailored to each community's unique needs. By analyzing common characteristics across communities and individual population differences, communities can develop targeted health education content that addresses shared needs while remaining responsive to specific demands. This emphasis on tailored health education strategies underscores the importance of individualized approaches in health education (Yi et al., 2025).

Breathing exercises are a core component of pulmonary rehabilitation to increase lung volume and capacity, making breathing easier (Şimşekli & Tan, 2025). Increasing inhalation and exhalation is a deep breathing exercise that can help improve oxygen saturation and lung function (Hasaini et al., 2024). Box breathing (BB) is a breathing exercise that, according to Research, shows a difference in breathing frequency between patients who practice BB and the control group. However, there is no difference in oxygen saturation (Muhlisoh et al., 2024).

DOI: https://dx.doi.org/10.30656/jpmwp.v9i2.11052

Fig 2. Box breathing video

Box breathing is a breathing exercise that uses four simple steps. The title is intended to help patients visualize a box with four equal sides while performing the exercise. This exercise can be performed in various situations and does not require a quiet environment to be effective. The BB technique involves four steps: inhale for 4 seconds, hold your breath for 4 seconds, exhale for 4 seconds, and hold your breath for 4 seconds. Then, repeat the session (Fig. 2). This technique is not only a performance and concentration booster but also a powerful stress reliever. It's a technique that can bring hope and optimism to all types of people, especially those with certain lung diseases and smokers.

Fig 3. Education and training activities for Villagers

This community service project, led by a dedicated community service team, used video as an educational medium to increase public understanding of BB's use as a non-pharmacological therapy to reduce respiratory complaints, as shown in Figure 1. The education provided to help patients learn and develop various skills to facilitate healthy behaviors is a type of therapeutic education (Andrews-Cooper & Kozachik, 2020). The community service team, consisting of health professionals and volunteers, had the opportunity to conduct education and practice, and to provide support by answering questions from participants to facilitate Posyandu (Integrated Service Post) participants in applying the skills using the BB technique. Video education was also shown during implementation, and participants were enthusiastic about watching it (Fig. 3). Research indicates that health education using audiovisual media significantly improves health literacy (Prawesti et al., 2018). Health videos can also improve participants' knowledge and attitudes (Romantika et al., 2020).

Educational programs are crucial in providing individuals with the knowledge and skills necessary to deftly navigate the complexities of their conditions (Rafael Henriques et al., 2024). A respiratory rate education and rehabilitation program combines basic principles of respiratory physiology, respiratory physiotherapy exercises, and education on proper inhaler use. This study demonstrated statistically significant and clinically relevant improvements in fatigue, exercise capacity, and dyspnea, indicating the potential of education and rehabilitation initiatives to improve self-management interventions for individuals with chronic respiratory conditions (Blánquez Moreno et al., 2018).

Table 2. Evaluation of the respiratory rate and comfort level of residents after the training intervention

	Comfort Level		Respirasi Rate (bpm)	
	Mean	**Min-Max**	**Mean**	**Min-Max**
Pre	4.7	4-6	17.5	16-20
Post	5.6	5-7	17.2	16-20

*bpm: breaths per minute

Evaluations of residents were conducted before and after the intervention activities. Table 2 showed that respondents' respiratory rates before and after the activities were on average 17,5 bpm (pre-minute) and 17,2 bpm (post-minute). This is likely due to fewer respondents experiencing shortness of breath during the activities. Previous Research showed a significant change in the respiratory rate of patients with pneumonia (Muhlisoh et al., 2024). This may be due to the shorter duration of implementation during the community service activity. Therefore, to achieve optimal results, it is necessary to conduct an assessment with an appropriate duration of intervention. However, the level of comfort among respondents showed an increase. Several respondents reported feeling more comfortable when using the BB technique, with breathing feeling more relaxed and regular.

Previous Research has shown that deep breathing exercises influence sympathetic and parasympathetic nervous system activity, which can reduce feelings of anxiety and stress (Bentley et al., 2023). Recent Research also suggests that deep breathing exercises performed on patients five days

DOI: https://dx.doi.org/10.30656/jpmwp.v9i2.11052

after surgery can reduce pain and anxiety, as well as increase comfort levels (Çiftçi et al., 2025). This aligns with the team's assessment of respondents who received education and training in BB techniques, who reported greater comfort. Future community service programs are recommended to include follow-up assessments to evaluate the long-term adoption of box breathing and its effect on reducing respiratory complaints among rural populations.

CONCLUSION

The majority of community service participants were elderly, female, elementary school educated, and employed. Education about acute respiratory infections (ARI) is crucial because this disease is a leading cause of death and disability worldwide. This community service program used video education to increase participant enthusiasm in learning box breathing therapy. Audiovisual media increased public health literacy about non-pharmacological therapies for respiratory complaints and improved comfort. The community service team, in response to the many questions raised during implementation, demonstrated their dedication and adaptability by explaining in terms the community understood, despite the varying levels of education.

Furthermore, this increased understanding may have been due to the direct delivery of education accompanied by two-way communication, which enhanced participant understanding. There was an increase in the community's understanding of respiratory disorders and the box breathing technique, and the community members were able to practice the proper way to perform the box breathing technique. The involvement of health cadres and post-education evaluation underscored the participants' role as key contributors to improved public health. The community service program, with the active participation of its members, significantly improved public understanding of ARI and BB therapy. There was only a very slight decrease in respondents' respiratory frequency. However, this minor change is a testament to the collective effort and the potential for further improvement. To ensure the sustainability and continued effectiveness of the program, a long-term assessment is still needed to determine its full impact.

ACKNOWLEDGEMENTS

The community service team would like to thank the Intan Martapura Health College and the Banjar Insan Prestasi Foundation for funding this activity. The team also thanks the Martapura 1 Community Health Center and the Tunggul Irang Ilir Village Health Cadres for facilitating the community service activities, and the students, Nor Risda, M. Nor Arifudin, and Ahmad Rizqo Abdillah, for assisting in the implementation of the community service.

REFERENCES

Ahmed, A., Devi, R. G., & Priya, A. J. (2021). Effect of Box Breathing Technique on Lung Function Test. *Journal of Pharmaceutical Research International*, 25–31. https://doi.org/10.9734/jpri/2021/v33i58A34085

Andrews-Cooper, I. N., & Kozachik, S. L. (2020). How Patient Education Influences Utilization of Nonpharmacological Modalities for Persistent Pain Management: An Integrative Review. *Pain Management Nursing*, *21*(2), 157–164. https://doi.org/10.1016/j.pmn.2019.06.016

Balban, M. Y., Neri, E., Kogon, M. M., Weed, L., Nouriani, B., Jo, B., Holl, G., Zeitzer, J. M., Spiegel, D., & Huberman, A. D. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. *Cell Reports Medicine*, *4*(1), 100895. https://doi.org/10.1016/j.xcrm.2022.100895

Bentley, T. G. K., D'Andrea-Penna, G., Rakic, M., Arce, N., LaFaille, M., Berman, R., Cooley, K., & Sprimont, P. (2023). Breathing Practices for Stress and Anxiety Reduction: Conceptual Framework of Implementation Guidelines Based on a Systematic Review of the Published Literature. *Brain Sciences*, *13*(12), 1612. https://doi.org/10.3390/brainsci13121612

Betka, S., Adler, D., Similowski, T., & Blanke, O. (2022). Breathing control, brain, and bodily self-consciousness: Toward immersive digiceuticals to alleviate respiratory suffering. *Biological Psychology*, *171*, 108329. https://doi.org/10.1016/j.biopsycho.2022.108329

Blánquez Moreno, C., Colungo Francia, C., Alvira Balada, M. C., Kostov, B., González-de Paz, L., & Sisó-Almirall, A. (2018). Efectividad de un programa educativo de rehabilitación respiratoria en atención primaria para mejorar la calidad de vida, la sintomatología y el riesgo clínico de los pacientes con enfermedad pulmonar obstructiva crónica. *Atención Primaria*, *50*(9), 539–546. https://doi.org/10.1016/j.aprim.2017.03.019

Bussa-Carlson, A., Morrison, H., Taylor-Piliae, R., & Shea, K. (2024). Feasibility of a telehealth breathing intervention for patients with idiopathic pulmonary fibrosis. *Applied Nursing Research*, *79*, 151827. https://doi.org/10.1016/j.apnr.2024.151827

Çiftçi, H., Korkut, S., & Karaca, S. (2025). The Effect of Breathing Exercise With Incentive Spirometer on Pain, Anxiety, Comfort, and Physiological Parameters Before and After Cardiac Surgery: A Randomized Controlled Experimental Study. *Journal of PeriAnesthesia Nursing*. https://doi.org/10.1016/j.jopan.2025.02.005

Hasaini, A., Muhlisoh, M., & Sukmawaty, M. N. (2024). Effectiveness of Cyclic Sighing on Respiratory Rate and Function in Patients with Pneumonia. *Indonesian Journal of Global Health Research*, 6(5), 4034. https://doi.org/10.37287/ijghr.v6i5.4034

Muhlisoh, M., Hasaini, A., & Sukmawaty, M. N. (2024). Effectiveness of Box Breathing on Respiratory Rate and Oxygen Saturation in Patients with COPD. *Indonesian Journal of Global Health Research*, 6(4),

3798. https://doi.org/10.37287/ijghr.v6i4.3798

Nieman, D. C., & Sakaguchi, C. A. (2022). Physical activity lowers the risk for acute respiratory infections: Time for recognition. *Journal of Sport and Health Science*, *11*(6), 648–655. https://doi.org/10.1016/j.jshs.2022.08.002

O'Malley, K., Kinsella, E. L., Igou, E. R., English, A., & McMahon, J. (2025). Hero-based interventions to promote health and education in young people: A scoping review. *SSM - Mental Health*, *8*, 100439. https://doi.org/10.1016/j.ssmmh.2025.100439

Pearkao, C., Apiratwarakul, K., Wicharit, L., Potisopha, W., Jaitieng, A., Homvisetvongsa, S., Namwaing, P., & Pudtuan, P. (2025). Development of a Mobile App Game for Practicing Lung Exercises: Feasibility Study. *JMIR Rehabilitation and Assistive Technologies*, *12*, e63512–e63512. https://doi.org/10.2196/63512

Prawesti, I., Haryanti, F., & Lusmilasari, L. (2018). Effect of health education using video and brochure on maternal health literacy. *Belitung Nursing Journal*, *4*(6), 612–618. https://doi.org/10.33546/bnj.176

Rafael Henriques, H., Correia, A., Santos, T., Faria, J., Sousa, D., Portela, J., & Teixeira, J. (2024). Nursing interventions to promote dyspnea self-management of complex chronic patients: An integrated review. *International Journal of Nursing Sciences*, *11*(2), 241–257. https://doi.org/10.1016/j.ijnss.2024.03.008

Romantika, I. W., Lusmilasari, L., Prabandari, Y. S., & Syahrul, S. (2020). Application of video-based health education in improving mother's knowledge and attitudes about behavioral problems among preschool children. *Enfermería Clínica*, *30*, 172–176. https://doi.org/10.1016/j.enfcli.2019.07.071

Ross, I., Bick, S., Ayieko, P., Dreibelbis, R., Wolf, J., Freeman, M. C., Allen, E., Brauer, M., & Cumming, O. (2023). Effectiveness of handwashing with soap for preventing acute respiratory infections in low-income and middle-income countries: a systematic review and meta-analysis. *The Lancet*, *401*(10389), 1681–1690. https://doi.org/10.1016/S0140-6736(23)00021-1

Şimşekli, D., & Tan, M. (2025). Effects of breathing exercises performed with virtual reality on dyspnea, anxiety and quality of life in COPD patients: A randomized controlled trial. *Heart & Lung*, *71*, 7–13. https://doi.org/10.1016/j.hrtlng.2025.01.014

Vos, T., Lim, S. S., Abbafati, C., Abbas, K. M., Abbasi, M., Abbasifard, M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abdollahpour, I., Abolhassani, H., Aboyans, V., Abrams, E. M., Abreu, L. G., Abrigo, M. R. M., Abu-Raddad, L. J., Abushouk, A. I., … Murray, C. J. L. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, *396*(10258), 1204–1222. https://doi.org/10.1016/S0140-6736(20)30925-9

Yi, M., Gao, Q., Yang, X., & Chen, W. (2025). Needs of health education for community residents – A survey across difference types of community in Hangzhou of China. *Chinese General Practice Journal*, *2*(1), 100048. https://doi.org/10.1016/j.cgpj.2025.100048

Yun, R., Bai, Y., Lu, Y., Wu, X., & Lee, S.-D. (2021). How Breathing Exercises Influence on Respiratory Muscles and Quality of Life among Patients with COPD? A Systematic Review and Meta-Analysis. *Canadian Respiratory Journal*, *2021*, 1–11. https://doi.org/10.1155/2021/1904231