International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Feldenkrais Breathing Method on Functional Capacity, Dyspnea and Quality of Life in Subjects with Mild to Moderate Asthma

Dr. Rutuja Jadhav[1], Dr. Tadi Sunil Kumar[2], Pranav Bhosle[3]

[1]Assistant Professor, Department of Cardiovascular & Respiratory Physiotherapy, Nanded Physiotherapy College & Research Center, Nanded, India
[2]Associate Professor, Department of Cardiovascular & Respiratory Physiotherapy, Shree Siddheshwar College of Physiotherapy, Solapur, India
[3]Associate Professor, Department of Musculoskeletal Physiotherapy, Nanded Physiotherapy College & Research Center, Nanded, India

ABSTRACT

Background: Asthma is a chronic inflammatory airway disorder characterized by recurrent episodes of dyspnea, reduced exercise tolerance, and impaired quality of life. Along with pharmacological management, physiotherapy interventions such as breathing retraining play an important role in improving respiratory efficiency and reducing symptom severity. The Feldenkrais Method is a movement-based therapeutic approach that focuses on breathing awareness, postural alignment, and neuromuscular coordination. Feldenkrais breathing exercises may help improve breathing patterns, reduce accessory muscle overactivity, and enhance functional performance in individuals with asthma.

Aim: To evaluate the effectiveness of the Feldenkrais breathing method on functional capacity, dyspnea, and quality of life in subjects with mild to moderate asthma.

Methodology: This Quasi-experimental pre-test and post-test study was included 52 subjects with mild to moderate asthma aged between 25 and 40 years. Baseline assessment was conducted using the Six Minute Walk Test (6MWT) for functional capacity, SOB Questionnaire for dyspnea, and SF36 Quality of Life Questionnaire for quality of life. Participants were undergone a structured Feldenkrais breathing program consisting of breathing awareness training, diaphragmatic breathing, rib mobility exercises, and coordinated breathing with movement. The intervention was given for 45-50 minutes per session, 3 days per week for 8 weeks. Post-intervention assessment was conducted using the same outcome measures.

Results: The results showed statistically significant improvement in all outcome measures following the intervention. The mean 6MWT distance improved ($p < 0.001$), indicating improved functional capacity. The mean SOBQ score reduced from 26.02 to 3.14 ($p < 0.001$), indicating reduced dyspnea. Quality of life measured using SF-36 improved significantly ($p < 0.001$). These findings suggest significant clinical improvement following Feldenkrais breathing intervention.

Conclusion: Feldenkrais breathing method is an effective intervention for improving functional capacity, reducing dyspnea, and enhancing quality of life in individuals with mild to moderate asthma.

Keywords: Asthma, Feldenkrais Breathing Method, Functional capacity, Dyspnea, Quality of Life.

1. INTRODUCTION

Asthma is a chronic, heterogeneous respiratory disease characterized by airway inflammation, bronchial hyper-reactivity, and variable airflow obstruction[1]. It presents with symptoms such as coughing, chest tightness, wheezing, and shortness of breath, which vary in frequency and severity and are usually reversible either spontaneously or with treatment[2]. In addition to being a clinical condition, asthma represents a significant public health concern due to its association with reduced quality of life, increased healthcare utilization, absenteeism from work or school, and reduced functional capacity[3].

In India, approximately 30 million individuals are affected by asthma, with a prevalence of about 2.4% in adults and 4–20% in children. Asthma accounts for nearly 57,000 deaths annually and remains a major contributor to morbidity, particularly in rural populations[4]. Globally, asthma affects nearly 300 million people, and its prevalence continues to rise due to factors such as urbanization, industrialization, and environmental exposure[5,6]. In India, asthma continues to impose a substantial public health burden with an estimated adult prevalence of 2–3%[7].

Asthma is characterized by airway inflammation with infiltration of eosinophils, lymphocytes, and mast cells leading to mucosal oedema, mucus hypersecretion, airway narrowing, and increased airway responsiveness[8,9,11]. Repeated inflammation may result in airway remodelling, causing persistent airflow limitation and chronic disease burden[10]. Immunoglobulin E mediated immune responses to allergens also play a key role in airway inflammation and hyperreactivity[11].

Several risk factors contribute to asthma development, including genetic predisposition, environmental exposures, air pollution, tobacco smoke, occupational irritants, indoor allergens, obesity, and psychological stress[12]. These interactions highlight that asthma is influenced by both genetic susceptibility and environmental triggers. The major pathophysiological features include airway inflammation, airway hyperresponsiveness, and airflow limitation[13].

Asthma is broadly classified into atopic and non-atopic types. Atopic asthma usually begins in childhood and is associated with a history of allergic conditions, whereas non-atopic asthma commonly develops in adulthood without allergic associations[14,30]. The increasing prevalence of asthma in urban and developing regions is largely attributed to lifestyle changes and environmental pollution[15].

The disease also has systemic effects, with associated conditions such as obesity, anxiety, and gastroesophageal reflux worsening disease outcomes[16]. Clinically, asthma presents with episodic symptoms such as wheezing, dyspnea, chest tightness, and cough, often worsening at night or early morning and triggered by allergens, exercise, infections, or environmental factors[17,18].

Diagnosis is based on clinical presentation and demonstration of variable airflow limitation. A reduced FEV_1/FVC ratio (<75%) with improvement in FEV_1 of at least 12% and 200 mL following bronchodilator administration confirms reversibility[19, 20]. Peak expiratory flow variability greater than 20% may also indicate asthma. Assessment tools such as the Asthma Control Test help evaluate disease control and guide treatment strategies[21].

While pharmacological management remains the cornerstone of asthma treatment, there is growing recognition of the role of physiotherapy interventions in improving symptom control, functional capacity, and quality of life[22]. Physiotherapy management focuses on correcting dysfunctional breathing patterns, improving ventilation, and enhancing physical fitness through breathing retraining techniques such as diaphragmatic breathing, pursed-lip breathing, and the Buteyko method[23]. These interventions have been shown to reduce dyspnea, improve exercise tolerance, and enhance self-management confidence[24].

Airway clearance techniques such as Active Cycle of Breathing Techniques, autogenic drainage, and oscillatory devices may help improve secretion clearance and lung function[25]. Exercise training further improves cardiovascular fitness, reduces deconditioning, and enhances functional capacity while also addressing psychological factors such as anxiety and depression[26]. Flexibility training, posture correction, and relaxation techniques such as yoga and Pilates may further improve respiratory efficiency and quality of life[27].

The Feldenkrais Method is a somatic educational approach developed by Moshe Feldenkrais that focuses on improving movement efficiency, posture, and breathing through gentle, mindful movements and awareness training[28]. This method promotes neuromuscular coordination and efficient breathing patterns through awareness of movement and body mechanics. Feldenkrais breathing techniques may help improve chest wall mobility, breathing coordination, and relaxation, potentially improving respiratory efficiency in individuals with asthma.

Functional capacity in respiratory diseases is commonly assessed using the Six-Minute Walk Test (6MWT), a simple and reliable test developed by the American Thoracic Society to evaluate exercise tolerance and cardiopulmonary response to activity[29–31]. The test reflects daily functional performance and is associated with quality of life outcomes[32].

Dyspnea during activities of daily living can be assessed using the UCSD Shortness of Breath Questionnaire (SOBQ), which has demonstrated responsiveness in pulmonary rehabilitation studies[33]. Health-related quality of life is commonly assessed using the Short Form-36 (SF-36), a widely used questionnaire covering physical, emotional, and social health domains[34].

Although breathing exercises are commonly used in asthma rehabilitation, limited research exists regarding the effectiveness of the Feldenkrais breathing method in improving functional capacity, dyspnea, and quality of life. Therefore, this study aims to evaluate the effectiveness of the Feldenkrais breathing method in individuals with mild to moderate asthma.

2. MATERIALS AND METHODS

This study was designed as a quasi-experimental pre–post intervention study to evaluate the effectiveness of the Feldenkrais breathing method on functional capacity, dyspnea, and quality of life in individuals with mild to moderate asthma. Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study. All participants were informed about the study procedure and written informed consent was obtained. Participants were informed about their right to withdraw from the study at any time without any consequences.

The study was conducted in a physiotherapy outpatient department over a period of 12 months. Participants diagnosed with mild to moderate asthma by a qualified pulmonologist were recruited for the study. A total of 52 participants were recruited using a convenience sampling method based on eligibility criteria.

Participants were included in the study if they were between 25 and 40 years of age and had a clinical diagnosis of mild to moderate asthma confirmed by a pulmonologist. Both male and female participants were considered eligible. Subjects were required to have a forced expiratory volume in one second (FEV_1) of less than 80% of the predicted value and an FEV_1/FVC ratio of less than 75%. Only clinically stable individuals without any acute exacerbations or respiratory infections within the previous four weeks were included. Additionally, participants who were willing to participate and able to provide written informed consent were recruited for the study.

Participants were excluded if they had severe asthma or any other significant respiratory disorders. Individuals with musculoskeletal conditions that could limit thoracic mobility and interfere with breathing exercises were also excluded. Subjects with neurological disorders affecting movement coordination or motor control were not considered. Additionally, participants with cardiovascular or other systemic diseases that could limit exercise participation were excluded. Individuals who had participated in pulmonary rehabilitation programs or any structured breathing exercise programs within the previous three months were also excluded from the study.

2.1.Outcome Measures

Functional capacity was assessed using the Six Minute Walk Test (6MWT). Participants were instructed to walk as far as possible for six minutes along a standardized 30-meter corridor. The total distance covered in meters was recorded.

Dyspnea was assessed using the Shortness of Breath Questionnaire (SOBQ), a validated tool consisting of 24 items measuring breathlessness during activities of daily living. Each item is scored on a 6-point scale (0–5), with higher scores indicating greater dyspnea.

Quality of life was assessed using the Short Form-36 (SF-36) questionnaire. This instrument consists of 36 items covering eight health domains including physical functioning, bodily pain, general health, vitality, social functioning, emotional role, and mental health. Scores range from 0 to 100, with higher scores indicating better health status.

2.2.Intervention Protocol

Participants underwent a structured Feldenkrais breathing intervention program administered three times per week for eight weeks. Each session lasted approximately 45–50 minutes and consisted of awareness training, breathing exercises, movement integration, and relaxation.

2.2.1. Intervention Components

1. Awareness Training (Weeks 1–2): Participants were introduced to Feldenkrais principles including body awareness, posture, and movement efficiency. Exercises included body orientation on the floor, upper limb alignment, lower limb movement awareness, and cognitive awareness of body contact with the environment.
2. Feldenkrais Breathing Exercises (Weeks 3–8): Breathing exercises focused on awareness of inspiration and expiration, coordination of breathing with movement, and perception of ease of breathing. Each breathing activity was performed for approximately 15 minutes.
3. Pelvic Movement Training (Weeks 4–8): Pelvic mobility exercises included pelvic tilting, clockwise and anticlockwise pelvic rotations, and pelvic sliding movements. Emphasis was placed on proprioceptive feedback and coordination with breathing.
4. Trunk Mobility Exercises (Weeks 5–8): Trunk exercises included rolling movements, side-to-side movements, and segmental trunk mobility exercises integrated with breathing awareness.
5. Cool Down Phase: Cool down consisted of relaxation breathing, body awareness exercises, and cognitive awareness of body contact with the supporting surface.

Each exercise was performed for 10 repetitions with 2 sets.

Treatment Fidelity: All instructions were provided in a language understandable to the participants to improve compliance and adherence to the intervention protocol.

3. RESULTS

A total of 52 participants with mild to moderate asthma completed the study. The demographic characteristics and outcome measures were analysed to determine the effectiveness of the Feldenkrais breathing method on functional capacity, dyspnea, and quality of life. Pre and post intervention data were analyzed using paired t-test and Wilcoxon signed rank test.

The age distribution of participants showed that most subjects belonged to the 36–40 years age group (47%), followed by the 31–35 years age group (33%), while 20% of participants were in the 25–30 years age group. This indicates that most participants were in the higher age range of the inclusion criteria.

Functional capacity was assessed using the Six Minute Walk Test (6MWT). The mean pre-intervention 6MWT distance was 305.33 ± 51.36 meters, which significantly improved to 415.40 ± 42.75 meters following the intervention. Statistical analysis using the paired t-test demonstrated a highly significant improvement ($t = -20.214$, $df = 51$, $p < 0.001$).

This finding indicates that the Feldenkrais breathing method significantly improved functional exercise capacity in individuals with mild to moderate asthma.

Dyspnea was assessed using the Shortness of Breath Questionnaire (SOBQ). The mean SOBQ score significantly decreased from 26.02 ± 7.23 before intervention to 3.14 ± 1.69 after intervention. Analysis using the Wilcoxon signed-rank test showed a statistically significant reduction in dyspnea ($Z = 13.78$, $p < 0.001$).

The reduction in SOBQ scores indicates that Feldenkrais breathing exercises were effective in reducing the perception of breathlessness in study participants.

Quality of life was measured using the SF-36 questionnaire. The mean pre-intervention SF-36 score was 60.69 ± 5.60, which significantly improved to 81.75 ± 4.25 following the intervention. Paired t-test analysis demonstrated a statistically significant improvement ($t = -19.678$, $df = 51$, $p < 0.001$).

This improvement suggests that Feldenkrais breathing intervention had a positive impact on health-related quality of life.

Overall, statistically significant improvements were observed in all outcome measures following the 8-week Feldenkrais breathing intervention. Functional capacity improved, dyspnea reduced, and quality of life significantly increased, supporting the effectiveness of the intervention in individuals with mild to moderate asthma.

4. DISCUSSION

The present study evaluated the effectiveness of the Feldenkrais breathing method on functional capacity, dyspnoea, and quality of life in individuals with mild to moderate asthma using the 6-Minute Walk Test (6MWT), UCSD Shortness of Breath Questionnaire (SOBQ), and SF-36 questionnaire. To the best of our knowledge, this is among the first studies investigating the effect of the Feldenkrais breathing method specifically in asthma patients, although similar benefits have been reported in chronic obstructive pulmonary diseases.

Asthma is characterized by chronic airway inflammation, bronchial hyperresponsiveness, and variable airflow limitation, which significantly affect functional capacity and quality of life. These pathophysiological changes often result in activity limitations, breathlessness, and psychological distress. The participants in this study represented typical asthma populations, with environmental exposure, socioeconomic factors, family support, and adherence to exercise influencing disease management and outcomes. Compliance with breathing exercises appeared to be an important

determinant of improvement, highlighting the importance of patient education and motivation in rehabilitation programs.

The findings of this study demonstrated that Feldenkrais breathing exercises resulted in improvements in functional capacity, reduction in dyspnoea, and enhancement in quality of life. Improvement in 6MWT distance suggests better exercise tolerance and cardiopulmonary efficiency following the intervention. These improvements may be attributed to better breathing coordination, improved thoracic mobility, and enhanced neuromuscular control promoted by the Feldenkrais method.

A significant reduction in dyspnoea was also observed as measured by the SOBQ. The emphasis on diaphragmatic breathing, relaxation, and awareness of breathing patterns may improve respiratory mechanics and reduce the use of accessory muscles, thereby decreasing the sensation of breathlessness during daily activities. Improved proprioceptive awareness and reduction in thoracic muscle tension may also contribute to more efficient ventilation.

Quality of life improvements observed in SF-36 scores indicate that Feldenkrais breathing may have both physical and psychological benefits. Improvements in physical functioning, emotional well-being, and social participation suggest that breathing retraining combined with movement awareness may positively influence overall health status. These findings are consistent with previous studies showing that mind-body interventions improve both physiological and psychological outcomes in chronic respiratory diseases.

Previous research in COPD populations has shown that Feldenkrais training improves respiratory parameters, movement efficiency, and emotional well-being (Stephens et al., 2020; Hillier and Worley, 2019). Although direct evidence in asthma is limited, studies on breathing retraining techniques such as the Buteyko and Papworth methods have shown improvements in dyspnoea and quality of life (Thomas et al., 2003; Holloway et al., 2007). Systematic reviews of breathing exercises also support improvements in asthma control and quality of life (Ritz et al., 2013). The present findings are consistent with these reports and suggest that Feldenkrais breathing may act through similar mechanisms including improved diaphragmatic efficiency, reduced hyperinflation, improved oxygenation, and reduced physiological stress.

Clinically, the Feldenkrais method is a safe, non-invasive, and cost-effective intervention that can be incorporated into pulmonary rehabilitation programs. By improving body awareness and breathing efficiency, it may enhance patient self-management and long-term adherence to therapy. This makes it a useful adjunct to pharmacological management in asthma care.

However, certain limitations must be considered. The quasi-experimental design without a control group limits causal interpretation. The relatively small sample size and recruitment from a single center limit generalizability. The short duration of follow-up also prevents conclusions regarding long-term sustainability of benefits. Future studies should include randomized controlled trials with larger samples, longer follow-up periods, and objective outcome measures such as spirometry.

In conclusion, this study provides preliminary evidence that the Feldenkrais breathing method improves functional capacity, reduces dyspnoea, and enhances quality of life in individuals with mild to moderate asthma. These findings support the potential role of Feldenkrais breathing as an adjunct physiotherapy intervention in asthma rehabilitation and encourage further research to strengthen the evidence base.

5. CONCLUSION

This study provides preliminary evidence that the Feldenkrais breathing method significantly improves

functional capacity, reduces dyspnea, and enhances quality of life in individuals with mild to moderate asthma. The observed benefits may be attributed to improved breathing mechanics, postural control, and enhanced body awareness. As a safe, non-invasive, and cost-effective intervention, Feldenkrais breathing shows promise as an adjunct to conventional asthma rehabilitation. Further well-designed randomized controlled trials are warranted to establish its long-term effectiveness and clinical applicability.

6. REFERENCES

1. Andreasson KH, Skou ST, et al. Protocol for a multicentre randomized controlled trial to investigate the effect on asthma-related quality of life from breathing retraining in patients with incomplete asthma control attending specialist care in Denmark. BMJ open. 2019 Dec 1;9(12):e032984.
2. Barnes PJ, Drazen JM. Pathophysiology of asthma. Asthma and COPD. Br J Clin Pharmacol.1996;42(1):3-10.
3. Bahadori K, Doyle-Waters MM, Marra C, Lynd L, Alasaly K, Swiston J, FitzGerald JM. Economic burden of asthma: a systematic review. BMC pulmonary medicine. 2009 May 19;9(1):24.
4. Agrawal S, Pearce N, Ebrahim S. Prevalence and risk factors for self-reported asthma in an adult Indian population: a cross-sectional survey. The international journal of tuberculosis and lung disease. 2013 Feb 1;17(2):275-82.
5. To T, Stanojevic S, Moores G, Gershon AS, Bateman ED, Cruz AA, Boulet LP. Global asthma prevalence in adults: findings from the cross-sectional world health survey. BMC public health. 2012;12(1):204.
6. Aggarwal AN, Chaudhry K, Chhabra SK, D Souza GA, Gupta D, Jindal SK, Katiyar SK, Kumar R, Shah B, Vijayan VK. Prevalence and risk factors for bronchial asthma in Indian adults: a multicentre study. Indian Journal of Chest Diseases and Allied Sciences. 2006 Jan 18;48(1):13.
7. Jindal SK, Aggarwal AN, Gupta D, Agarwal R, Kumar R, Kaur T, Chaudhry K, Shah B. Indian study on epidemiology of asthma, respiratory symptoms and chronic bronchitis in adults (INSEARCH). The international journal of tuberculosis and lung disease. 2012 Sep 1;16(9):1270-7.
8. Barnes PJ. Cellular and molecular mechanisms of asthma and COPD. Clinical science. 2017 Jul 1;131(13):1541-58.
9. Holgate ST. Pathogenesis of asthma. Clinical & Experimental Allergy. 2008 Jun;38(6):872-97.
10. WW BJ, AM JM. Asthma. From bronchoconstriction to airways inflammation and remodeling. Am J Respir Crit Care Med. 2000;165:1720-45.
11. Holgate ST. Pathogenesis of asthma. Clinical & Experimental Allergy. 2008 Jun;38(6):872-97.
12. Toskala E, Kennedy DW. Asthma risk factors. In International forum of allergy & rhinology 2015 Sep;5(S1):S11-S16.
13. Barnes PJ, Drazen JM. Pathophysiology of asthma. Asthma and COPD. 2002 Jan 1:343-59.
14. Swathi G, Kumar TS, Raghunadh N, Margrett CM. Effectiveness of Buteyko Breathing Technique versus Nadi Shuddhi Pranayama to Improve Pulmonary Function in Subjects with Bronchial Asthma. International Journal of Science and Healthcare Research. 2021;6(4):124-35.
15. Subbarao P, Becker A, Brook JR, Daley D, Mandhane PJ, Miller GE, Turvey SE, Sears MR. Epidemiology of asthma: risk factors for development. Expert review of clinical immunology. 2009 Jan 1;5(1):77-95.

16. Dixon AE, Holguin F, Sood A, Salome CM, Pratley RE, Beuther DA, Celedón JC, Shore SA. American Thoracic Society Ad Hoc Subcommittee on Obesity and Lung Disease. An official American Thoracic Society Workshop report: obesity and asthma. InProc Am Thoracic Society 2010 Sep;7(5):325-335.
17. National Heart Lung and Blood Institute. Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention. Revised 2006. http://www. ginasthma. org.
18. Gibson PG, McDonald VM. Asthma–COPD overlap 2015: now we are six. Thorax. 2015 Jul 1;70(7):683-91.
19. Pellegrino R, Viegi G, Brusasco V, Crapo RO, Burgos F, Casaburi RE, Coates A, Van Der Grinten CP, Gustafsson P, Hankinson J, Jensen R. Interpretative strategies for lung function tests. European respiratory journal. 2005 Nov 1;26(5):948-68.
20. Pakkasela J, Ilmarinen P, Honkamäki J, Tuomisto LE, Andersén H, Piirilä P, Hisinger-Mölkänen H, Sovijärvi A, Backman H, Lundbäck B, Rönmark E. Age-specific incidence of allergic and non-allergic asthma. BMC pulmonary medicine. 2020 Jan 10;20(1):9.
21. Bateman ED, Bousquet J, Keech ML, Busse WW, Clark TJ, Pedersen SE, GOAL Investigators Group. The correlation between asthma control and health status: the GOAL study. European Respiratory Journal. 2006 Dec 29;29(1):56-62.
22. Bruton A, Lee A, Yardley L, Raftery J, Arden-Close E, Kirby S, Zhu S, Thiruvothiyur M, Webley F, Taylor L, Gibson D. Physiotherapy breathing retraining for asthma: a randomized controlled trial. The Lancet Respiratory Medicine. 2018 Jan 1;6(1):19-28.
23. Cooper S, Oborne J, Newton S, Harrison V, Coon JT, Lewis S, Tattersfield A. Effect of two breathing exercises (Buteyko and pranayama) in asthma: a randomized controlled trial. Thorax. 2003 Aug 1;58(8):674-9.
24. Freitas DA, Holloway EA, Bruno SS, Chaves GS, Fregonezi GA, Mendonca KM. Breathing exercises for adults with asthma. Cochrane Database of Systematic Reviews. 2013(10).
25. Gosselink R. Controlled breathing and dyspnea in patients with chronic obstructive pulmonary disease (COPD). Journal of Rehabilitation Research & Development. 2003 Sep 2;40(5):25-33.
26. Mendes FA, Gonçalves RC, Nunes MP, Saraiva-Romanholo BM, Cukier A, Stelmach R, Jacob-Filho W, Martins MA, Carvalho CR. Effects of aerobic training on psychosocial morbidity and symptoms in patients with asthma: a randomized clinical trial. Chest. 2010 Aug 1;138(2):331-7.
27. Thomas M, McKinley RK, Freeman E, Foy C, Prodger P, Price D. Breathing retraining for dysfunctional breathing in asthma: a randomized controlled trial. Thorax. 2003 Feb 1;58(2):110-5.
28. Kimmel M, Irran C, Luger MA. Bodywork as systemic and inter-enactive competence: participatory process management in Feldenkrais® Method and Zen Shiatsu. Frontiers in Psychology. 2015 Jan 12;5(1424):1-23.
29. Lombardi C, Berti A, Cottini M, Roca E, Ventura L. Using the 6-min walk test to assess the clinical response to mepolizumab and conventional therapy in severe eosinophilic asthma. ERJ Open Research. 2023 Oct 2;9(5):00114-2023.
30. Enright PL. The six-minute walk test. Respiratory care. 2003 Aug 1;48(8):783-5.
31. Morales-Blanhir JE, Palafox Vidal CD, Rosas Romero MD, García Castro MM, Londoño Villegas A, Zamboni M. Six-minute walk test: a valuable tool for assessing pulmonary impairment. Jornal brasileiro de pneumologia. 2011;37:110-7.

32. Dracup K, Walden JA, Stevenson LW, Brecht ML. Quality of life in patients with advanced heart failure. The Journal of heart and lung transplantation: the official publication of the International Society for Heart Transplantation. 1992 Mar 1;11(2 Pt 1):273-9.
33. Prescott HC, Wirtz DJ, et al. Pulmonary Rehabilitation Improves Dyspnea More than Quality of Life and Functional Capacity in Women with Asthma. Pulmonary Rehabilitation 2009 (p. A3419). American Thoracic Society.
34. Framework IC. The MOS 36-item short-form health survey (SF-36). Med Care. 1992 Jun;30(6):473-83.
35. Siora A, Vontetsianos A, et al. Small airways in asthma: From inflammation and pathophysiology to treatment response. Respir Med. 2024 Feb:222:107532.
36. Monisha R and Yasmeen Imtiaz Efficacy of Feldenkrais method vs. Respiratory gymnastics for patients with chronic obstructive pulmonary disease. International Journal of Current Advanced Research 2017;6(11):7229-7232.
37. Agrawal S, Pearce N, Ebrahim S. Prevalence and risk factors for self-reported asthma in an adult Indian population: a cross-sectional survey. The international journal of tuberculosis and lung disease. 2013 Feb 1;17(2):275-82.
38. Braman SS. The global burden of asthma. Chest. 2006 Jul 1;130(1):4S-12S.
39. Bateman ED, Hurd SS, Barnes PJ, Bousquet J, Drazen JM, FitzGerald M, Gibson P, Ohta K, O'Byrne P, Pedersen SE, Pizzichini E. Global strategy for asthma management and prevention: GINA executive summary. European Respiratory Journal. 2007 Dec 31;31(1):143-78.
40. Thomas M, McKinley RK, Freeman E, Foy C, Prodger P, Price D. Breathing retraining for dysfunctional breathing in asthma: a randomized controlled trial. Thorax. 2003 Feb 1;58(2):110-5.
41. Gibson PG, McDonald VM. Asthma–COPD overlap 2015: now we are six. Thorax. 2015 Jul 1;70(7):683-91.
42. Meys R, Janssen SM, Franssen FM, Vaes AW, Stoffels AA, van Hees HW, Van Den Borst B, Klijn PH, Burtin C, van't Hul AJ, Spruit MA. Test-retest reliability, construct validity and determinants of 6-minute walk test performance in adult patients with asthma. Pulmonology. 2023 Nov 30;29(6):486-94.
43. Ayiesah R, Roslina AM. A study comparing the effectiveness of the Feldenkrais Method versus the standard pulmonary rehabilitation program in improving the Borg score and 6-minute walk in patients with chronic obstructive pulmonary disease (COPD). Journal of Health and Translational Medicine (JUMMEC). 2012 Dec 24;15(2):16-21.
44. Rikli RE, Jones CJ. The reliability and validity of a 6-minute walk test as a measure of physical endurance in older adults. Journal of aging and physical activity. 1998 Oct 1;6(4):363-75.
45. Jones PW. Quality of life, symptoms and pulmonary function in asthma: long-term treatment with nedocromil sodium examined in a controlled multicentre trial. Nedocromil Sodium Quality of Life Study Group. European Respiratory Journal. 1994 Jan 1;7(1):55-62.
46. Baiardini I, Sicuro F, Balbi F, Canonica GW, Braido F. Psychological aspects in asthma: do psychological factors affect asthma management? Asthma research and practice. 2015 Aug 5;1(1):7.
47. Sousa JC, Pina A, et al. Asthma control, quality of life, and the role of patient enablement: a cross-sectional observational study. Primary Care Respiratory Journal. 2013 Jun;22(2):181-7.

48. Masoli M, Fabian D, Holt S, Beasley R, Global Initiative for Asthma (GINA) Program. The global burden of asthma: executive summary of the GINA Dissemination Committee report. Allergy. 2004 May;59(5):469-78.
49. Vu LN, Nghia NQ, Tuan TM, Phuong TH, Vo HL, Viet KN, Giang TB. Measuring health-related quality of life in Vietnamese patients after kidney transplantation. Frontiers in surgery. 2021 Aug 17;8:646629.
50. Mahler DA, Mackowiak JI. Evaluation of the short-form 36-item questionnaire to measure health-related quality of life in patients with COPD. Chest. 1995 Jun 1;107(6):1585-9.