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Letter to the Editor

Effect of Breathing Meditation Program on the Lung Function in Physically Disabled Elderly Individuals

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Dear Editor-in-Chief

Lung function and respiratory muscle play important roles in the structural function of the respiratory system, and (1, 2) that impaired respiratory muscle may lead to decreased lung function due to as a result of pressure gradients and impaired air exchange across the alveolar surfaces. Aerobic exercise, physical activity, and breathing exercises were effective as intervention therapies. However, intervention methods using aerobic exercise and physical activity were difficult to apply (3, 4).

Therefore, as an intervention therapy to improve systematically breathing for disabled older adults breathing exercises combined with meditation can be considered an efficient method for improving mental and physical health by strengthening the respiratory muscles using inspiration and exhalation (5).

This study aimed to present a breathing meditation program. It aimed to present a meditation program combined with breathing practice for continuous and active participation, to investigate changes in lung function accordingly, and to investigate changes in lung function accordingly.

For this purpose, study participants were divided into two groups: an experimental group that practiced breathing meditation and a control group that did not practice breathing meditation. The pre-and post-measurement results were then compared and were analyzed using the pulmonary function test. Pulmonary function measurements included the following: forced vital capacity (FVC) to determine whether there is a restrictive ventilation disorder by measuring lung capacity during forced expiration, forced expiratory volume in 1 second (FEV1) to determine the degree of obstructive ventilatory disorder by measuring expiratory volume during one second of effort, and peak expiratory flow (PEF) to measure/determine obstructive lung disease status. The FEV1/FVC, which determine airway resistance, and PEF, which determines the degree of airway resistance, were measured.

This study was approved by the relevant Changwon National University Institutional Review Board, an ethics institution founded to protect the bioethics and safety of the study participants (Ethical Number-7001066-202012-HR-029).

The mean and standard deviation of the data were calculated using SPSS 25.0 (IBM Corp., Armonk, NY, USA). The interaction effect was analyzed using Bonferroni correction/test, and the significance level was set at $P<.05$.

The analysis revealed significant differences in FVC, FEV1/FVC, and PEF; in contrast/on the other hand, no significant difference was seen in FEV1 (Table 1).

Table 1: Results of variables of group and time events

Variable	GROUP				Main Effect		Interaction Effect
	EG(n=10)		CG(n=10)		Group	Time	
	Pre	Post	Pre	Post			
FVC	1.35±.11	1.53±.11	1.37±.09	1.38±.08	.168	.000**	.000***
FEV1	.90±.08	.093±.09	.86±.07	.86±.07	.182	.221	.184
FEV1/FVC	67.09±7.39	60.86±8.04	63.23±6.55	62.81±5.85	.000***	.760	.000***
PEF	2.70±.12	2.91±.16	2.72±.12	2.72±.15	.170	.000***	.000***

**Significant difference at *P*<.01, ***significant difference at *P*<.001

Maximum ventilation (MVV), expiratory flow rate (EFR), and FEV1 decrease by approximately 30ml each year. Therefore, study results suggest that decreased/lowered FEV1 is due to decreased lung elasticity rather than the mechanism of reduced/narrowed bronchial radius (6, 7). The decline in respiratory function in older adults with physical disabilities is often caused by cardiovascular disease and is closely associated with to increased mortality (8, 9). In particular, lung disease in in older adults with (physical) disabilities is caused by a decrease in lung capacity and cognitive function, such as a decrease in the expansion pressure of the lungs due to increased stiffness of the rib cage, a decrease in ciliary function due to aging of the lungs, and a decrease in ventilation due to weakened respiratory muscles (10). Therefore, the cardiopulmonary function of older adults with physical disabilities is significantly lower than that of the general public, thus improvement measures are urgently needed. The results of the present study suggest that the breathing meditation program can be effectively applied to improve lung function in older adults with physical disabilities.

Conflict of interest

The authors declare no conflict of interest.

References

1. Statistics Korea (2023). 2023 Senior Citizen Statistics. https://www.kostat.go.kr/board.es?mid=a10301010000&bid=10820&act=view&list_no=427252
2. Nagano A, Wakabayashi H, Maeda K, et al (2021). Respiratory sarcopenia and sarcopenic respiratory disability: concepts, diagnosis, and treatment. *J Nutr Health Aging*, 25(4): 507-515.
3. Raina P, Gilsing A, Mayhew AJ, et al (2020). Individual and population level impact of chronic conditions on functional disability in older adults. *PLoS One*, 15(2): e0229160.
4. Hirota R, Terashima Y, Ohnishi H, et al (2024). Prognostic factors for respiratory dysfunction for cervical spinal cord injury and/or cervical fractures in elderly patients: a multicenter survey. *Global Spine J*, 14(1): 101-112.
5. Wang K, Jia S, Zhao W, Ge M, Dong B (2023). The creatinine-to-cystatin C ratio (a surrogate marker of muscle mass) as a predictor of lung function decline in older adults: A nationwide longitudinal study in China. *Respir Med*, 211: 107197.
6. Hee-jin Kim, & Lee Mi-seon (2022). The effects of a meditation program on daily living activities, self-expression, and quality of life in elderly people with mild dementia. *J Korean Wellness Society*, 17(2): 33-41.
7. Villamil-Parra W, Mancera-Soto E, Torrella JR, Cristancho-Mejía E (2023). Effect of an 8-week physical exercise program on functional physical fitness and quality of life in elderly people with Chronic Obstructive Pulmonary Disease residing at high altitude. *Trials*, 24(1): 1-13.
8. Yang YL, Xiang ZJ, Yang JH, et al (2020). Association of β-blocker use with survival and pulmonary function in patients with chronic obstructive pulmonary and cardiovascular disease: a systematic review and meta-analysis. *Eur Heart J*, 41(46): 4415-4422.

9. Zhao M, Wang M, Zhang J, et al (2020). Advances in the relationship between coronavirus infection and cardiovascular diseases. *Biomedicine & Pharmacotherapy*, 127: 110230.
10. Woods A, Gustafson O, Williams M, Stiger R (2023). The effects of inspiratory muscle training on inspiratory muscle strength, lung function and quality of life in adults with spinal cord injuries: a systematic review and Meta-analysis. *Disabil Rehabil*, 45(17): 2703-2714.