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Letter to the Editor

Effect of Breathing Yoga Practice on Resting Vital Capacity in Elderly Women with Intellectual Disability

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Dear Editor-in-Chief

Intellectual disability is a condition in which cognitive abilities, such as language and expressive abilities, and motor abilities, such as flexibility, agility, and cardiorespiratory endurance, are delayed by 2–4 years compared to non-disabled individuals (1). In elderly women with disabilities, the prevalence of mental and physical diseases is increasing because of psychological anxiety and social isolation, and they are subject to many restrictions daily (2). Yoga practice significantly improves blood pressure and physical strength factors, making it an effective exercise rehabilitation therapy for elderly individuals at high risk of high blood pressure and cardiovascular disease (3). Hatha yoga, which emphasizes posture and breathing techniques, maintains and repeats isometric exercises that contract various muscles and induces muscle relaxation in fixed postures, increasing muscle strength, muscular endurance, flexibility, blood pressure, lung capacity, and cardiorespiratory endurance (3). Physiologically, it is an effective exercise method that increases lymphatic system- and metabolism-related hormone levels. As a representative aerobic exercise with breathing, the risk of rapid heart rate and increased lung capacity is low; therefore, it can be performed more safely. It does not require special skills and complicated equipment; therefore, it can be practiced easily by anyone, regardless of sex or age. Because it is a training that is performed statically with breathing, it can satisfy mental stability and physical training simultaneously; therefore, it can be practiced by individuals with disabilities. This is an efficient exercise method that can be performed consistently. Currently, previous studies related to yoga and disabled elderly investigated changes in the elderly's joints and muscles due to physical activity (4-10). Most studies are on breathing and lung function, and studies on breathing and lung function are lacking. Therefore, this study aimed to analyze the effects of breathing yoga on the lung function of elderly women with intellectual disabilities. The participants were divided into two groups; experimental and control groups, and the pre- and post-measurement results were compared and analyzed using a quark pulmonary function testing. Resting spirometry measures expiratory reserve volume (ERV), inspiratory reserve volume (IRV), inspiratory capacity (IC), and tidal volume (VT) during slow and long expiration after maximal inspiration.

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 means and standard deviations were calculated

using SPSS (version 25.0; IBM Corp., Armonk, NY, USA). The interaction effect was Bonferroni's correlation analysis, and the significance level was significant difference only in IC. Specifically, there was a significant difference in ERV and VT. Interaction effects included ERV, IRV, IC, and VT. Two significant results appeared (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			
ERV	.55±.31	.91±.32	.55±.31	.43±.30	.10	.000***	.000***
IRV	.93±.32	1.38±.32	99.50±.41	.73±.47	.076	.213	.000***
IC	1.86±.54	2.53±.51	1.86±.35	1.49±.55	.022*	.075	.000***
VT	2.39±.68	2.03±.63	2.03±.63	1.93±.57	.087	.027*	.018*

*Significant difference at $P<.05$, ***Significant difference at $P<.001$

The result synthesis attempted slow and steady flow second background on resting lung capacity due to the characteristic influence of yoga breathing, leading to a positive static result divided by weight. This is the heart rate at which all lees prefer static breathing and movement over dynamic exercise.

Conflict of interest

The authors declare no conflict of interest.

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