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BREATH-HOLDING TIME AND SPIROMETRY PARAMETERS IN HEALTHY LONG-TERM MEDITATORS: A COMPARATIVE STUDY

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Introduction: Breath-holding time (BHT) and spirometry are measures of respiratory efficiency and are thought to improve with meditation.

Objectives: This cross-sectional study aimed to assess BHT and spirometry in healthy long-term meditators (LTMs) and non-meditators.

Methods: Healthy, skilled LTMs (n=18) practicing Buddhist meditation consistently >3 years, recruited by a validated intake interview and age-sex matched healthy non-meditators (n=18) selected through purposive sampling were included.
Forced vital capacity (FVC), Forced expiratory volume in the first second (FEV_1), FEV_1/FVC, Peak expiratory flow rate (PEFR), Maximal expiratory flow at 25, 50, 75 of vital capacity (MEF25, 50, 75) and tidal volume were recorded using Fitmate-Med PRO (Cosmed, Rome, Italy). BHT was calculated using respiratory signals recorded with a respiratory belt transducer (AD Instruments, Australia). Inspiratory (BHT_{ins}) and expiratory (BHT_{exp}) BHT was measured in the seated position, in seconds from the time of breath holding following deep inspiration and full expiration respectively. Maximum value of 3 similar trials at 5-minute intervals were analyzed using independent sample t-test and Pearson correlation.

Results: The LTMs (50% male; mean (SD) age 43.06 (8.41) years; height 1.65 (0.11) meters; BMI 23.2 (2.19) kgm^{-2}) and controls (50% male; mean (SD) age 43.28 (8.35) years; height 1.65 (0.09) meters; BMI 24.72 (2.38) kgm^{-2}) were comparable. LTMs had higher BHT_{ins} (mean (SD); 74 (29.84) vs. 53.61 (26.83) seconds, p =0.038), PEFR (mean (SD); 10.14 (2.11) vs. 8.62 (2.0) liters per second; p <0.05), higher slow vital capacity (SVC), FVC, FEV_1, MEF 75, 50, 25, FEF 25-75, tidal volume and BHT_{Exp} (p >0.05) than controls. BHT_{ins} significantly correlated with FVC [LTMs; (r= 0.655, p=0.003), controls; (r= 0.471, p=0.049)] and SVC [LTMs; (r= 0.638, p=0.004), controls; (r= 0.534, p=0.022)].

Conclusions: Higher BHT, PEFR and vital capacity suggest better respiratory efficiency in LTMs compared to matched non-meditators.

Keywords: **Long-term meditation, Spirometry, Breath-holding time, Respiratory efficiency**