

46<sup>th</sup> World Congress on  
**NURSING CARE, NEUROLOGY AND NEUROMUSCULAR DISEASES**  
October 22-23, 2018 Madrid, Spain

**Inspiratory muscle training in children and adolescents living with neuromuscular diseases: A pre-experimental study**

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People with Neuromuscular Diseases (NMD) have high risk of morbidity and mortality caused by underlying respiratory muscle weakness and an inability to cough effectively. Respiratory muscle training aims to preserve or improve respiratory muscle strength, delay respiratory morbidity onset, optimize ventilation and ultimately improve Health-Related Quality of Life (HRQoL). Inspiratory Muscle Training (IMT) among children and adolescents with NMD is controversial, owing to differences in pathophysiology and potential risk of muscle damage in some conditions. Despite reports of potential benefits, there is insufficient evidence to guide clinical practice regarding the use of IMT in this sub-population. A pre-experimental, observational pre-test post-test study was conducted to determine the effect of a six-week IMT program on pulmonary function, Peak Expiratory Cough Flow (PECF), inspiratory muscle strength (Pimax), upper limb function and coordination (using the Motor Function Measurement (MFM) scale), adverse events and HRQoL using the PedsQL. Eight participants (n=8 boys; mean age 12.71±3.53 years) with a variety of NMD were included. Training consisted of 30 breaths, twice daily, five days a week, for six weeks with an electronic threshold device (Power breathe K3, HaB International Ltd, Southam, UK). There were no significant changes in spirometry, PECF or HRQoL. However, maximum inspiratory pressure (Pimax) (p<0.01), strength-index (p<0.02), peak inspiratory flow (p<0.02) and MFM (p<0.03) improved significantly from pre- to post intervention. Overall patient satisfaction with the IMT program was extremely high, with a mean of 9.13±1.73 out of a possible score of 10. No adverse events occurred. This study suggests that short term IMT may improve inspiratory muscle strength as well as improving upper limb function and coordination. IMT seems to be safe and effective in this sub-population, however randomized controlled trials are needed to determine the mid and long-term effect of IMT in children and adolescents with NMD.

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