



## Effects on Physical Condition of an Exercise Programme in Clarinetist and Oboist Vocational Education Students through an E-learning Tool

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### Abstract

The majority of studies related to the health of musicians deal with the specific epidemiology of injuries in these professionals, whereas very few studies address prevention strategies. Therefore, measures to reduce the risk of injury must be sought, with the main premise being individualisation and the characteristics of the musical instruments. A literature review found that the most common causes of injury stem from the actual instrument, lack of physical fitness (Sardá, 2003) and the demands of the repertoire (Bejjani et al., 1996; Carson, 2003), among others. This study proposes applying a specific autonomous programme of exercises targeting clarinetists and oboists designed to improve their overall physical condition and body posture by strengthening the upper extremities and spine using an e-learning tool. To verify the exercise programme, a pilot study lasting 18 sessions was conducted with 19 vocational education students in the clarinet and oboe specialities. The participants' aerobic capacity did not change significantly, but they did present changes in the strength of their trapezius and latissimus dorsi ( $p=0.001$ ). With regard to body posture, the alignment of the head-neck vertex ( $p=0.003$ ), the retracted chin ( $p=0.025$ ) and the acromion aligned with the ear and the greater trochanter ( $p=0.008$ ) were the most representative data. Similarly, these changes were reflected in instrumental performance, with the alignment of the acromion with the earlobe and the greater trochanter ( $p=0.005$ ). After several modifications to the programme, a second study with 12 sessions ( $n=29$ ) was conducted. The strength values were also significant for the trapezius ( $p=0.003$ ) and the latissimus dorsi ( $p=0.008$ ), and predictive analyses highlighted the possible variations in the strength of the latissimus dorsi after the first 6 sessions ( $p=0.006$ ). Furthermore, the tests performed showed that the results indicated favourable changes in body posture during performance with the instrument compared to the initial assessment. The users positively rated the e-learning tool used through a questionnaire designed ad-hoc. On completion of the study, it was concluded that the exercise programme proposed via the e-learning tool facilitates a positive development of strength and favourable posture changes in the standing position reflected in instrumental performance, whereby it could constitute an effective injury prevention procedure in this group.

**Keywords:** music, prevention, injuries, exercise, E-learning

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