

**Introduction:** Temporomandibular disorders (TMD) are a heterogeneous group of musculoskeletal and neuromuscular conditions involving the temporomandibular joint complex (TMJ), and surrounding musculature and osseous components, that occurs predominantly in women [1]. TMD is classified as intra-articular or extra-articular and its common symptoms includes limited or asymmetric mandibular motion, joint noises (clicking, popping or crepitus), pain in the masticatory muscles, TMJ pain, earache, headache, tinnitus and dizziness [2]. Diagnosis is most often based on history and physical examination. Treatment of patients with TMD should, initially, be based on the use of conservative, reversible, and evidence-based therapeutic modalities like physiotherapy, therefore a multidisciplinary approach is essential [3]. The purpose of this study is to evaluate the benefits of manual therapy (MT) when compared with self-rehabilitating exercises at home in patients with TMD.

**Material and methods:** A randomized, controlled clinical trial was performed involving a group of 20 subjects of both genders with TMD diagnosed according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD). The subjects were assigned to two groups: 10 in the experimental group (EG) and 10 in the control group (CG). A pre-teaching session for both groups was held to explain the therapeutic exercises (TE) at home and delivered a handout with the TE. This study took place in a 6 weeks period where pain scores, perception of tinnitus/deafness, headache, joint noises, and range of mandibular (vertical) motion were evaluated and recorded at stage 0 and again at the end of the clinical trial for both groups. In addition to the TE, the EG was submitted to physiotherapy sessions with manual mobilization, massage and relaxation techniques, twice a week, while the CG only performed the TE referred above. All participants gave their writing informed consent prior to inclusion in the investigation

**Results:** The results evidence that the treatment with MT and TE is more effective that TE applied on a standalone basis. There was a decrease in all aspects of pain in the EG pain referred by the patient: decrease of 3.5 values in pain numeric rating scale (PNRE), TMJ pain: decrease of 2.9 values in PNRE, muscle pain: decrease of 2.9 values in PNRE) In the CG, there were no significant changes in the aspects of pain. In the range of motion (ROM) there was an increment of 5.39 mm in the EG; however, the CG had a decrease of 0.01 mm in the ROM.

**Discussion and conclusions:** MT combined with TE showed promising results to treat TMD. The EG showed reduction of symptoms and increase of mandibular ROM. However, the CG did not show significant improvements, the subjects remained overlapping compared with the first evaluation at stage 0. Therefore, this program brings promising effects in reducing symptomatology and improving quality of life.

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## References

- [1] Scrivani SJ, Keith DA, Kaban LB. Temporomandibular disorders. *N Engl J Med.* 2008;359,2693–2705.
- [2] Sakaguchi K, Mehta NR, Abdallah EF, et al. Examination of the relationship between mandibular. *J Craniomandibular Pract.* 2007;25(4):15–18.
- [3] Armijo-Olivo S, Magee D. Cervical musculoskeletal impairments and temporomandibular disorders. *J Oral Maxillofac Res.* 2013;3(4):1–18.

## Relationship between body composition, sprint performance and vertical jump tests in young elite soccer players

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**Introduction:** Elite soccer requires high-level competencies across many specific physical qualities [1]. Being able to ensure players' progress at the required levels in order to achieve elite status is of paramount importance to scientists and practitioners. We analyzed anthropometric and sports performance data of young elite soccer players at 2 different times over a competitive season and investigated the relationship between body composition and physical tests of vertical jumps and sprint.

**Materials and methods:** Body weight, height and sum of skinfolds, squat jump (SJ), countermovement jump (CMJ) and sprint tests (V5 and V20) were evaluated at two different times over a competitive season. To analyze the results we used anova function provided by the statistical computing program R where a linear mixed model to assay the effect of height, Body Mass Index (BMI) and total value of the skinfolds (SSF) on the performance of athletes in each test was performed. All procedures were approved by an ethical committee.

**Results:** Eighty-eight male with mean age of  $15.53 \pm 1.45$  years were included in this study and significant relationships were observed between the results of physical tests of vertical jump and sprint speed and SSF and BMI. SSF positively

correlated in SJ test ( $F=9.96$ ,  $p<.002$ ), CMJ ( $F=11.29$ ,  $p<.001$ ), V5 ( $F=5.94$ ,  $p<.016$ ) and V20 ( $F=33.41$ ,  $p<4.327e-08$ ). Such as SSF, BMI positively correlated in SJ test ( $F=9.68$ ,  $p<.002$ ), CMJ ( $F=5.58$ ,  $p<.019$ ) and V20 ( $F=22.58$ ,  $p<6.731e-06$ ). If we use a significance value  $p<.10$  the BMI influences not only the running times in V20 but also in V5. We could also verify that the older athletes were the ones that presented better results in all the tests.

**Discussion and conclusions:** It was hypothesized that a low adiposity would be associated with a better performance, which is confirmed by the results of this investigation showing that SSF negatively correlates with sprint performance in the V20 test and jump tests. These results are in line with previous findings which revealed a positive correlation between total body fat with sprint and jump performances [2]. With the relationships observed, the importance of a body optimization for better sports income is clear. In a game as demanding as soccer, where there are constant jumps and sprints, it is essential that athletes have an amount of muscle mass within the recommended values so that their performance is not affected during the exercise [5]. An unbalanced body composition, with a high amount of fat mass, represents a greater wear in the motor actions, negatively influencing the athlete's activity [3]. To obtain an ideal body composition, the role of the Nutritionist and Coach is crucial in order to guide and provide the athletes with the necessary bases for a balanced and autonomous diet and training so that they can optimize their performance and thus achieve excellent performances. Additionally, body composition may be used for talent selection process.

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## References

- [1] Bangsbo J, Mohr M, Krstrup P. Physical and metabolic demands of training and match-play in the elite football player. *J Sports Sci.* 2006.
- [2] Nikolaidis PT. Physical fitness is inversely related with body mass index and body fat percentage in soccer players aged 16–18 years. *Lab Human Perform Rehabil: Med Pregl.* 2012.
- [3] Ina Garthe T, Truls R. Per Egil Refsnes and Jorunn Sundgot-Borgen (2012). Effect of nutritional intervention on body composition and performance in elite athletes. *European Journal of Sport Science.* 6. Guerra, Turibio Leite de Barros e Isabela (2004). *Ciência do Futebol. Manole.*

## Physical exercise and functional fitness of older adults in day care center

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**Introduction:** The physical and cognitive decline that occurs during aging translates into an inability to carry out daily living tasks with consequent impacts on social relationships. Functional fitness (FF) is generally defined as the ability to perform daily living activities without difficulty [1] and represents a powerful and independent risk factor for premature mortality [2]. However, the decline in FF with aging does not occur in a linear rate; a significant decrease occurs with advancing age, and between 70 and 80 years old appears to be a critical period of life [3]. This is due to the progressive decline in FF, which includes muscular strength, flexibility, balance, agility, gait velocity, and cardiorespiratory fitness [4]. It has been well established that elderly who spend more time in physical activity (PA) or less time in sedentary behaviors exhibit better FF. Assessing elderly FF performance is an essential element in designing effective exercise programs for them [5]. The purpose of this study was therefore to assess elderly FF whom are users of day care Center.

**Materials and methods:** Forty-eight elderly non-institutionalized, users of a day care center, with  $79.7 \pm 7.1$  years old, and a body mass index,  $27.7 \pm 3.5$  kg m<sup>2</sup>, were assigned to a specific multicomponent training composed by an aerobic endurance, strength, balance/coordination exercises, 45-min session, for 8 weeks, twice a week. The physical parameters assed were strength, aerobic endurance, flexibility and agility/balance. For upper body strength maximal amount of weighted arm curls was measured; for lower body strength the maximal amount of chair-ups were registered. Aerobic endurance was measured as the number of steps performed in 2 min (2-min step test). Upper body flexibility was assessed by back-scratch, and lower body flexibility was assessed by sit-and-reach test. For testing agility/balance, an 8-foot up-and-go test was used. All subjects gave their written informed consent prior to inclusion.

**Results:** The FF values before and after the intervention test were different ( $p<.05$ ); 30-s chair stand  $10.2 \pm 1.4$  versus  $16.1 \pm 2.6$  times; arm curl  $10.9 \pm 3.2$  versus  $18.9 \pm 3.5$  time; 2-min step ( $70.5 \pm 16$  versus  $98.3 \pm 12.4$  step), 8-foot up-and-go ( $9.8 \pm 4.7$  versus  $7.1 \pm 2.4$  s), chair sit-and-reach ( $12.9 \pm 11.2$  versus  $-8.1 \pm 9.9$  cm) and for the back scratch test ( $-14.1 \pm 9.8$ ,  $-10.2 \pm 6.1$  cm) respectively.

**Discussion and conclusions:** This combined exercise was effective in improving all FF components related to daily living activities. The results demonstrate the importance of elderly participation in physical exercise leading to a lower FF decline. Despite exercise is often portrayed as inaccessible without expensive gym facilities and a grueling experience for those who take part, it seems to be an inexpensive, easily accessible approach to improve health and overall well-being.