Abstract

Risk factors prevalence in handball athletes with and without overuse injury history

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Descrição gerada automaticamente]()](https://orcid.org/0000-0002-8558-6754)Inês Ventura \*, Sofia Vieira, Joana Rosa, Margarida Feliciano, José Brito 1 , Luciano Maia Alves Ferreira 1 , Duarte Tavares 2 and Manuel Barbosa de Almeida 1**

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† Presented at the 6th International Congress of CiiEM—Immediate and Future Challenges to Foster One Health, Almada, 5–7 July 2023.

Handball is a demanding team sport with a high risk of injuries, particularly indirect or non-contact injuries. Overuse injuries, resulting from cumulative energy transfers, are common in handball and can lead to reduced training volume, pain, and decreased performance. Deficits in joint range of motion (ROM), external/internal rotator strength ratio, and scapular dyskinesis have been identified as modifiable intrinsic risk factors. This study aims to compare the prevalence of risk factors as rotation range of motion, shoulder external/internal rotator strength ratio, and scapular dyskinesis and their association with sociodemographic characteristics in handball athletes with and without a history of overuse injury. A cross-sectional study design was employed, involving registered male handball athletes from senior and under-20 teams in the 2nd division from Lisbon and Setubal districts. The athletes with a history of dominant shoulder overuse injury in the last 12 months were assigned to the injury group, while exclusion criteria were being underage, having cognitive impairments, recent orthopedic shoulder surgery, or traumatic shoulder injury. Three measurements with a 30 second rest were taken using the Kforce-Link® pull dynamometer to assess the external/internal rotator force, a digital inclinometer, through the Clinometer® smartphone application, to evaluate shoulder ROM, and a measuring tape to assess scapular displacement through the Lateral Scapular Slide Test. A total of 59 participants integrated the study. Healthy group had 39 athletes with 22,8 ± 5,3 years with a body mass index (BMI) of 26,9 ± 4,5 kg/m2 and unhealthy group had 20 athletes 24,0 ± 7,0 years and BMI of 25,1 ± 3,7 kg/m2. No significant differences in most variables between groups, except for scapular displacement in standing position, at 90° shoulder abduction and 45° horizontal abduction, with maximum internal rotation of the shoulder and external rotation ROM. Risk factors prevalence had rates under 50% in both groups except for scapular dyskinesis. Functional adaptations in handball may lead to a shift in ROM, with a reduction in internal rotation and an increase in external rotation. Such alterations can contribute to selective muscle inhibition and atrophy, and a higher risk of overuse injuries. The study emphasized the importance of identifying changes in ROM, strength of rotational movements and scapular position to identify athletes at risk of injury. The findings suggested that an additional hour of training reduced the probability of having an internal rotation deficit, and each additional year of training decreased the risk of having a higher external rotator strength when compared to internal rotation measurements. Scapular dyskinesis with higher differences were found close to the shooting position in injury group athletes on the dominant side, which could present as a contributing factor to their injury history. Study limitations included potential measurement errors and the cross-sectional design, which prevented establishing causality. Future studies should adopt a longitudinal approach and improve measurement strategies to further investigate these findings. In conclusion, assessing ROM, scapular dyskinesis, and external/internal rotator strength ratio in handball athletes, regardless of injury history, is crucial for developing injury prevention programs and targeted rehabilitation. Both healthy athletes and those with a history of injury exhibit high rates of identified risk factors.

*Keywords:*handball; overhead; shoulder; overuse injury; risk factors; prevention.

*Acknowledgments***:** We would like to thank the Laboratório de Avaliação Física e Funcional em Fisioterapia (LAFFFi) by Sausport for the availability of material, including the KINVENT and all the support in the realization of this project and to FCT/MCTES for the financial support to CiiEM (UIDB/04585/2020) through national funds.