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Relationship of Neck, Shoulder, and Handgrip Strength with Upper Limb Injury Risk in Freestyle Wrestlers

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ABSTRACT

Introduction: Wrestling is one of the world's oldest and most physically demanding combat sports, which places significant stress on the upper extremities and cervical spine. Handgrip strength has been considered a valuable measure for assessing upper limb strength in wrestlers.

Objectives: This study investigated the prevalence of injury, the correlation between neck, shoulder, and handgrip strength, and the prediction of injury risk in competitive male freestyle wrestlers.

Materials and Methods: A cross-sectional observational correlation study was conducted with 70 male freestyle wrestlers (mean age 21.94±2.10 years; mean Body Mass Index (BMI) 25.78±2.74 kg/m^2), recruited via convenience sampling. Handgrip strength was assessed using a JAMAR dynamometer; shoulder and neck isometric strength were measured using a MicroFET handheld dynamometer. For statistical analysis, correlation and logistic regression analysis were conducted.

Results: An injury rate of 5.64 per 1000 players and a case rate of 34.29 per 100 players were observed. Positive correlation was observed between both right and left shoulder abduction, adduction, neck flexion, extension and lateral flexion. Also, right-hand grip strength was positively correlated with neck flexion and extension strengths. Injured wrestlers demonstrated significantly weaker neck flexion ($p<.001$), neck extension ($p=.023$), left shoulder adduction ($p=0.28$), left shoulder abduction($p=0.23$), right shoulder abduction ($p=0.37$), and right shoulder adduction($p=0.36$) strengths compared to non-injured wrestlers. On further analysis, neck flexion was found to be a significant injury risk predictor (OR=0.684, $p=.001$).

Conclusion: The prevalence of injuries in male freestyle wrestlers was 34.3%. Neck flexion strength was identified as a significant factor for predicting upper limb injury risk in freestyle male wrestlers. Hence, future randomised controlled trials should examine whether targeted cervical and shoulder conditioning interventions directly reduce injury incidence in the upper limb of freestyle wrestlers.

Keywords: Freestyle wrestling, Handgrip strength, Neck strength, Shoulder strength, Upper-limb injury risk.

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