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Association between Shoulder Proprioception and Scapular Protrusion Angle among Female Weightlifters: A Pilot Study

ANJALI LALJIBHAI SAKARIYA[1], JOYDIP SAHA[2]

ABSTRACT

Introduction: Effective shoulder stability in weightlifters relies on the coordinated interaction between proprioceptive control and proper scapular positioning. The repetitive overhead nature of weightlifting, combined with high training loads, places considerable stress on the shoulder complex. Deficits in shoulder proprioception or altered scapular alignment may therefore negatively influence performance and increase the risk of injury. Although both factors are recognised as important for shoulder function, limited research has examined their relationship in developmental weightlifters, particularly among female athletes.

Aim: To examine the association between shoulder proprioception, measured using the Upper Quarter Y Balance Test (YBT-UQ), and scapular protrusion angle in female developmental weightlifters.

Materials and Methods: A cross-sectional pilot study was carried out on 13 female developmental weightlifters aged 14–17 years. Shoulder proprioception was assessed bilaterally using the Upper Quarter Y Balance Test, while scapular protrusion angle was measured using a vernier calliper-based scapulometer. The association between shoulder proprioception and scapular protrusion angle was evaluated using the Chi-square test, and the strength of association was determined using Phi/Cramer's V.

Results: The mean YBT scores were 90.13±3.25 for the right upper limb and 89.16±3.13 for the left upper limb. The mean scapular protrusion angle was 1.41±0.60. Statistical analysis revealed a significant association between shoulder proprioception and scapular protrusion angle (χ^2=9.244, df=1, p=0.002). A strong effect size was observed (Phi/Cramer's V=0.843), indicating a strong relationship between the two variables.

Conclusion: This pilot study demonstrates a significant and strong association between shoulder proprioception and scapular protrusion angle in female developmental weightlifters.

Keywords: Chi-square test, Cross-sectional study, Female, Proprioception.

PARTICULARS OF CONTRIBUTORS:
1. Postgraduate Student, Abhinav Bindra Sports Medicine and Research Institute, Bhubaneswar, Odisha, India.
2. Associate Professor, Abhinav Bindra Sports Medicine and Research Institute, Bhubaneswar, Odisha, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Joydip Saha,
Associate Professor, Department of Movement Science, Abhinav Bindra Sports Medicine and Research Institute, Bhubaneswar-751024, Odisha, India.
Email: joydipsaha77@gmail.com