

The Impact of Isometric and Isotonic Exercises on the Reduction of Shoulder Muscle Injuries in Volleyball Players

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Abstract

Shoulder injuries are among the most frequent musculoskeletal problems in volleyball, often resulting from repetitive overhead movements and inadequate stabilization of the shoulder complex.

Preventive exercise programs are therefore essential to reduce injury risk and maintain performance. The present study investigated the effectiveness of isometric and isotonic conditioning protocols in decreasing the incidence of shoulder injuries among university-level volleyball players in Shkodër, Albania.

Thirty-six athletes (20 males, 16 females; mean age 20.7 ± 1.8 years) were randomly assigned to an isometric training group ($n = 12$), an isotonic training group ($n = 12$), and a control group ($n = 12$). The intervention lasted eight weeks, with three supervised sessions per week in addition to regular team practice. The isometric program focused on static contractions of the rotator cuff and scapular stabilizers, whereas the isotonic program emphasized concentric–eccentric strengthening with elastic bands and free weights.

Assessments included shoulder range of motion, muscle strength measured by dynamometry, and injury incidence recorded by medical staff. Both intervention groups showed significant strength gains compared with controls ($p < 0.05$). Injury incidence was reduced by 58% in the isometric group and by 46% in the isotonic group. Athletes in the isometric group also reported lower pain scores and faster return-to-play following minor strain.

These findings indicate that structured isometric and isotonic exercise programs can contribute to effective injury prevention in volleyball, with isometric training demonstrating a slight advantage.

Keywords: Volleyball, Isometric Training, Isotonic Training, Shoulder Injuries, Prevention