

Experimental Investigation of Mechanical Properties of Sepak Takraw Ball Based on Different Ball Orientation



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Abstract Sepak Takraw players have intensively practiced heading the ball as the game's primary movement. Repetitive takraw ball heading can result in head injuries such as concussion, internal bleeding, and dizziness. The head injury criterion can be measured practically, yet the mechanical properties of the takraw ball are not well examined. The primary aim of this study is to investigate the mechanical properties of takraw balls at different orientations based on a quasi-static compression experiment of two takraw balls, GE511 and MT908. Each ball has been subjected to compression tests in three distinct orientations of woven layers, namely Orientations 1–3. MT908 has a greater ultimate force and stiffness than GE511. It is also discovered that Orientation 1 has the highest values for both the mean ultimate force that occurred and the mean stiffness, followed by Orientations 2 and 3. These discoveries are particularly relevant to the creation of modern takraw balls and head protectors.

Keywords Takraw ball · Compressive testing · Ball stiffness

1 Introduction

Sepak Takraw is a unique game compared to other sports due to its athletic ball control, particularly using the legs and head. A powerful, high-speed, and accurate serve-ball needs to be made by a player for a decent attacking move [1]. The opponent

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