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ORIGINAL ARTICLE

# Epidemiology and prevention strategies for the musculoskeletal injuries in the paddle-tennis senior players

*Épidémiologie et stratégies de prévention pour les lésions musculosquelettiques chez les joueurs seniors de paddle tennis*

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## KEYWORDS

Athletic injury;  
Injury prevention;  
Paddle-tennis;  
Physiotherapy;  
Seniors

## Summary

**Objective.** – The purpose of this study was to describe the incidence of musculoskeletal injuries in paddle-tennis senior players.

**Method.** – The sample was composed of 131 active paddle-tennis senior players (107 men/24 women); with a mean age of  $56.8 \pm 4.6$  years [50 to 66 years] and an average playtime of  $9.4 \pm 6.3$  years. Inclusion criteria were: practicing paddle-tennis more than 3 times per week or more than 5 hours weekly practice. Participants who met inclusion criteria were interviewed about their injuries playing a paddle-tennis (type of injury, place, time of recovery. . .) and completed the International physical activity questionnaire (IPAQ).

**Results.** – The results showed that the joint lesions due to paddle-tennis are located mainly in the elbow (29.8%), lower back (27.5%), knee (22.9%), ankle (22.1%) and shoulder (20.6%). Body mass index, laterality and age could explain between 14.2% and 68.5% of the variance of injuries in the paddle-tennis senior players.

**Conclusions.** – Paddle-tennis creates specific demands on the musculoskeletal system of senior players, with acute injuries such as knee sprains; while chronic overuse injuries, such as lateral epicondylitis, shoulder pain and low back pain. The main injury risk factors observed were age, laterality and body mass index. These findings could help physiotherapists to create preventive programmes.

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## MOTS CLÉS

Traumatologie sportive ;  
Prévention des blessures ;  
Paddle-tennis ;  
Physiothérapie ;  
Personnes âgées

## Résumé

*Objectif.* – Le but de cette étude était de décrire l'incidence des blessures musculosquelettiques chez les joueurs de paddle-tennis seniors.

*Méthode.* – L'échantillon était composé de 131 joueurs de paddle-tennis seniors et actifs (107 hommes/24 femmes) ; avec un âge moyen de  $56,8 \pm 4,6$  ans [50 à 66 ans] et pratiquant ce sport depuis  $9,4 \pm 6,3$  ans. Les critères d'inclusion étaient les suivants : pratiquer paddle-tennis de plus de 3 fois par semaine ou réaliser plus de 5 heures de pratique hebdomadaire. Les participants qui répondaient aux critères d'inclusion ont été interrogés sur leurs blessures jouant un paddle-tennis (type de blessure, le lieu, le temps de récupération...) et ont dû compléter le questionnaire IPAQ (« International physical activity questionnaire »).

*Résultats.* – Les résultats ont montré que les lésions articulaires dues au paddle-tennis sont situées principalement au coude (29,8 %), bas du dos (27,5 %), genou (22,9 %), cheville (22,1 %) et à l'épaule (20,6 %). L'indice de masse corporelle ainsi que la latéralité et l'âge pourraient expliquer la variance (entre 14,2 % et 68,5 %) des blessures chez les joueurs de paddle-tennis seniors.

*Conclusions.* – Le paddle-tennis crée des demandes spécifiques au niveau du système musculosquelettique chez les joueurs seniors avec des blessures aiguës telles que les entorses du genou, tandis que les blessures chroniques sont dues au surmenage, comme l'épicondylite latérale par exemple, douleur au niveau de l'épaule et lombalgie. Les principaux facteurs de risque pour les blessures observées sont l'âge, la latéralité et l'indice de masse corporelle. Ces résultats pourraient aider les physiothérapeutes à créer des programmes de prévention.

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## 1. Background

Racket-Sports has many health benefits for seniors, including improved aerobic fitness, lowering body fat percentage, developing a more favourable lipid profile reducing the risk for developing cardiovascular disease, and improving bone health [1]. Racquet sports such as paddle-tennis, can be considered a well-proven static and dynamic form of exercise with many health benefits [1,2].

Epidemiological description of musculoskeletal injuries in racquet sports is increasingly necessary to detail the factors related to the injury [3]. Reported injury rates vary from 0.05 to 2.9 injuries per player per year in racket-sports [1]. This wide variance may be due to varied definitions of "injury" and variability in the age, gender, and ability level of the cohorts studied. In a cross-sectional survey study of 529 recreational senior players with an average age of 49.6 years, Jayanthi et al. [4] reported 3.0 injuries per 1000 h of play and a prevalence of 52.9 injuries per 100 players. Overuse injuries predominated, and 49% of injuries were in the lower extremities. An earlier study by Gruchow and Pelletier [5] suggested that individuals who play more than 2 h per day, 5 h/week (i.e., 10 h/week), increase their risk of lateral epicondylitis. Other studies examining volume of play and injury risk found no difference in injury rates based on hours of play per day up to 6 h/week [4]. There is however preliminary evidence that increasing skill level may increase injury risk, specifically, acute injuries [4]. Tournament play was more likely to result in injury than noncompetitive play (OR: 4.1) [6]. Training volumes of 6 h or a week or less, lower skill level, and noncompetitive paddle-tennis play may be more protective of injury in

senior recreational paddle-tennis players. Paddle-Tennis in general is considered a low-risk sport with minimal incidence of severe injury in seniors.

The repetition of specific actions and gestures can be a determining factor when suffering from one or more types of musculoskeletal injuries [7,8]. The unilateral nature of paddle-tennis creates certain adaptations over time. The significance of these adaptations as a way to improve performance, or a risk factor for injury, is debatable. Modification of adaptations of harmful is a typical goal for injury prevention programs in physiotherapy. The dominant upper extremity, including the shoulder, elbow, and forearm, overuse show muscle asymmetries. Adaptations of the trunk and lower extremity include a loss of internal rotation of the hip [9] and asymmetric hypertrophy of the contralateral rectus abdominis in racket-sport players [10]. Specific assessments can identify these at-risk segments, help guide prevention strategies which include technical errors, and assist in developing recommendations back to the game.

Finally, note that the concept of sports injury has been widely debated in the scientific literature: originally understood as an acute traumatic nature which takes place during a sporting activity [11–13], until more recently it included acute, subacute and chronic conditions not necessarily caused by a clearly identifiable trauma.

Given the absence of epidemiological data on injuries related to paddle-tennis practice, the purpose of this study was to describe the musculoskeletal injuries in senior recreational paddle-tennis senior players and to analyse the main risk anthropometric factors in this sport in order to create preventive programmes from physiotherapy.

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