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OPEN PEER REVIEW

Assessing the Association of Shoulder Pain Risk with Physical Fitness in Badminton Players at National Tournament Level

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1 Original submission

2 comments · 20 Aug 2022 – 22 Aug 2022

Referee 1 Reviewer

MINOR REVISION 20 Aug 2022

Dear author
The manuscript “The influence of physical fitness on shoulder pain risk in badminton players with national tournament level” matches the scope of the Asian Journal of Sports Medicine.
Please edit the title based on the objective of the study. Assessing the influence requires a clinical trial and follow-up. This study explained the association. Indicate the study’s design with a commonly used term in the title or the abstract.

Please provide keywords based on MeSH terms.

In the abstract, please change this sentence to address the prevalence of shoulder pain in badminton players and the importance of its prevention: “Studies on physical fitness in badminton players are scarce”.
Introduction
Please rewrite the introduction emphasizing statistics related to badminton rather than overhead players.
Please provide more information regarding the importance of the study. Please provide more specific and convincing details regarding the logic of the study. Please explain the scientific background and rationale for the investigation being reported.

Methods
Please define the names in this sentence: “ This research protocol 82 was reviewed and approved by the ethical committee of the XXX of XXX and was in 83 conformities with the Declaration of Helsinki.”

Discussion
Discuss the generalizability (external validity) of the study results.

Associate Editor

MAJOR REVISION 22 Aug 2022

I have collected the reviews.

2

Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Point to point responses to the reviewer's comments

We are grateful for very helpful comments. We have revised the manuscript accordingly. The revised parts are in red in the manuscript. The response to each comment is summarized in the following.

Point number 1

Reviewer's comment

Please edit the title based on the objective of the study. Assessing the influence needs a clinical trial and follow-up. This study explained the association. Indicate the study's design with a commonly used term in the title or the abstract

Our responses

We agree with the reviewer' s comment and have edited the title.

Text change

Assessing the association of shoulder pain risk with physical fitness in badminton players with national tournament level

Point number 2

Reviewer's comment

Please provide keywords based on mesh terms.

Our responses

We agree with the reviewer' s comment and have provided keywords based on mesh terms.

Text change

athletes, racquet sports, shoulder pain, physical fitness, risk factors

Point number 3

Reviewer’s comment

In the abstract please change this sentence to the prevalence of shoulder pain in badminton players and the importance of its prevention. “Studies on physical fitness in badminton players are scarce”.

Our responses

We agree with the reviewer’ s comment and have rewritten the sentence.

Text change

Shoulder pain which affects sports performance and activity of daily life is a common musculoskeletal problem experienced by badminton players.

Point number 4

Reviewer’s comment

Introduction

Please re-write the introduction emphasizing statistics related to badminton rather than overhead players. Please provide more information regarding the importance of the study. Please provide more specific and convincing details regarding the logic of the study. Please explain the scientific background and rationale for the investigation being reported.

Our responses

We agree with the reviewer’ s comment and have rewritten the sentences.

Text change

However, studies on shoulder pain in badminton players are scarce. A previous study has demonstrated training hours per day to be a risk factor of shoulder pain in badminton players aged 7-12 years (5).

As physical fitness, such as body range of motion, muscle flexibility and

balance ability, affects joints kinematics and kinetics (11,12), it should be studied to improve shoulder injury prevention as well. Past studies on shoulder range of motion (ROM) have revealed that decreased shoulder internal rotation (IR) and increased shoulder external rotation (ER) in dominant side were common comparing with nondominant side in healthy badminton players (9,13,14). Some studies have revealed that after playing two consecutive matches on the same day, ER of nondominant side significantly increased in female badminton players while ER of both sides significantly increased in male badminton players. Insufficient shoulder external rotation (ER) and glenohumeral internal rotation deficit (GIRD) on dominant side also have been revealed to increase the likelihood of shoulder injury (15). In badminton, only one previous study has compared shoulder ROM in badminton players with shoulder pain with those without, however, a positive relationship was not found (9).

Badminton overhead motion can be understood as a kinetic chain that transfers energy the lower limb, via the trunk, subsequently through the upper limbs to release it to the shuttlecock. All the parts of the chin are interrelated, where a breakage in one component of the chain can affect shoulder pain and injury (11,12,16,17). In recent years, a positive association between shoulder pain and injury and physical dysfunction of trunk ROM (18,19), balance ability (16), upper limbs power (20,21) and muscle flexibility (22) in other overhead motion sports. Nonetheless, such associations in badminton players are unknown.

We anticipated an association between physical fitness and overload in the shoulder that improving physical fitness, *i.e.*, muscle flexibility, shoulder ROM, trunk ROM and balance ability can prevent shoulder injury in badminton players.

Point number 5

Reviewer's comment

Methods

Please define the names in this sentence" This research protocol 82 was reviewed and

approved by the ethical committee of the XXX of XXX and was in 83 conformities with the Declaration of Helsinki.

Our responses

We have defined the names.

Text change

This research protocol was reviewed and approved by the ethical committee of the University of Tokyo and was in conformities with the Declaration of Helsinki.

Point number 6
Reviewer's comment

Discussion
Discuss the generalisability (external validity) of the study results

Our responses

We agree with the reviewer's comment.

Text change

Given the findings of our studies, not only in badminton players, but in other overhead motion sports players who require multi-limb coordination, physical fitness should be focused on. If shoulder pain occurs, players, coaches, physicians and physiotherapists should evaluate trunk rotation and balance ability so that prevention programs can be implemented to decrease risks to shoulder injuries as early as possible. Moreover, this study could be used for reference and be extended to find physical risk factor for improving injury prevention in other sports.

2 Revision 1

1 comment · 2 Nov 2022

Referee 1 Reviewer

ACCEPT 2 Nov 2022

Dear author
We appreciate the changes.