



ORIGINAL RESEARCH PAPER

Physiotherapy

A SURVEY ON COMMON MUSCULOSKELETAL INJURY AMONG ELITE BADMINTON PLAYERS

KEY WORDS: Nordic musculoskeletal scale, elite badminton players, musculoskeletal injuries.

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ABSTRACT **Background:** Badminton is one of the fastest racquet sports played using racquets to hit a shuttlecock across a net. It is a non-contact sport but injuries are still common as a player need to generate enormous power. Hence this study was done to find out the common musculoskeletal injuries among elite badminton players. **Materials And Method:** 100 ELITE badminton players were selected between the age of 18 to 28 and they were instructed about the Nordic musculoskeletal questionnaire and asked to fill the common site of injury in the questionnaire. **Result:** The percentage of injury for each joint was calculated and found that the shoulder and knee joints had higher percentage of incidence for injury. **Conclusion:** Hence, the elite badminton players are also more prone to injuries particularly in shoulder and knee joint, to reach the shuttle.

INTRODUCTION:

Badminton is officially the fastest of all racket sports. Players can hit the shuttlecock at speeds of up to 180mph (288kph) toward their opponent. But it is not just all about speed; a player can expect to run up to four miles (6.4km) around the court during a match whilst having the agility to maintain energy-busting rallies. So, stamina and agility are important, certainly at a competitive level, anyone can play badminton and the sport is a popular choice for people of all ages and fitness abilities.

ELITE BADMINTON PLAYER:

Elite badminton players are professionally and trained players who knows the tactics and the complete knowledge of the game. Elite badminton players have **incredible athletic ability** and must possess high levels of speed, agility, strength, flexibility and muscular endurance.

RECREATIONAL BADMINTION PLAYER:

Recreational badminton players characterized as they know the game play but they are not like professional players (agility, complete knowledge about the game) and involvement to play. The recreational sports have more participants which requires less commitment.

Continuous back and forth bend improve the spine strength, side changes of legs benefit for toes, heels and thighs. Badminton is a game in which you struggle hard to get a stamina better than a football players hands stronger than a volleyball smasher, core strength than a basketball player, wrist stronger than a squash player and agility higher than a table tennis player. While playing the badminton peoples physical quality is increasing and the level of technology is constantly improving.

Badminton is a non-contact sport, the game requires jumps, lunges, quick changes in the direction and rapid movement in order to stroke the shuttlecock from variety of postural position. Thus, the physical demands of a competitive games of badminton suggest that injuries to the limbs may be preventive ailment. Badminton is a low-risk sports, however injuries are still common as players needs to generate enormous power even while in disadvantaged postural position. The force involved in badminton professional players like **Fu Hai Feng** hold the record of smash speed of over 300km/hr.

According to **L.D Hensey** et al. Badminton is a sport of relatively low risk and that the majority of related injuries were chronic overuse injuries. Badminton is considered as low risk sports. Psychological motive of badminton players is to score points and get victory over the opponents, so he strikes the shuttle faster (smash). Competitive badminton players have a high level of technical skill, tactical competence and physical capacity. Badminton requires high intensity intermittent actions within a short period, so it may cause risk of injuries. Male badminton players were more prone to injuries than the female players. participation in badminton tournament may also increases high risk of injuries.

According to **LZEN** (1971), acute and subacute injuries resulting from participation in the sport of badminton are primarily tears, sprains, of the upper limb and lower limbs. Playing badminton can have a number of positive health and fitness benefits on your body. Increases aerobic fitness, with more oxygen circulated around body to increase the muscular endurance. Badminton increases the muscular strength, endurance and relives mental stress. Injuries during badminton have been reported to occur at a rate of 2.9 injuries per player per 1000 hours of badminton playing.

AIM AND OBJECTIVES

AIM:

1. Professional badminton players are experts in playing various type of trick short without any discomfort, but sometimes due to the overuse of the upper limb and lower limb, they may be chance of getting injury to the parts they overuse.
2. The aim of this study was to examine the common musculoskeletal injury among elite badminton players.

OBJECTIVES:

To examine the common musculoskeletal injuries among elite badminton players.

MATERIALS AND METHODOLOGY:

100 ELITE badminton players were selected between the age of 18 to 28 and they were instructed about the Nordic musculoskeletal questionnaire and asked to fill the common site of injury in the questionnaire.

Inclusion Criteria:

- SEX: Both male and female
- AGE: 18-28
- Elite badminton players
- Both right handers and left handers were included
- Regularly trained badminton player

Exclusion Criteria:

- Recreational badminton players
- Players with recent injuries
- Players with surgeries
- Player's training for other games.
- Improper trained players

STUDY PROCEDURE:

100 elite badminton players who met the selection criteria were selected and they were explained about the study, following which the participants signed the informed consent form. The subjects were then asked to fill the Nordic questionnaire which included the percentage of injury incidence of each joint.

RESULTS:

TABULAR PRESENTATION:

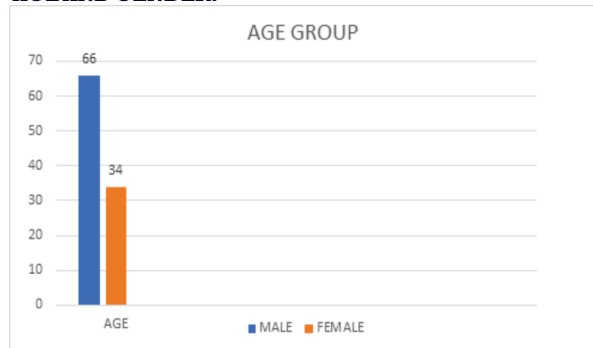
	GENDER	TOTAL NUMBER OF PARTICIPANTS	NUMBER OF PARTICIPANTS	AGE GROUPS
1	MALE	100 ELITE BADMINTON PLAYERS	66	19- 28yrs
2	FEMALE		34	18-25yrs

ANATOMICAL AREAS AFFECTED IN MUSCULOSKELETAL DISORDER:

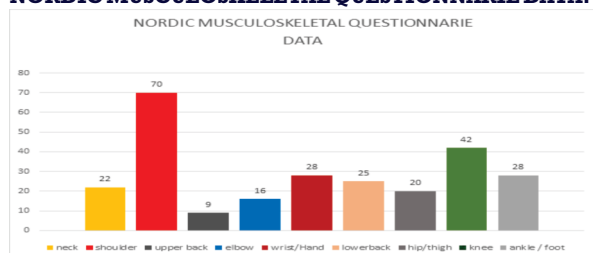
S.NO	ANATOMICAL AREA	NUMBER PF PLAYERS WITH PARTICULAR PROBLEMS	PERCENTAGE OF PLAYERS AFFECTED
1	NECK	29	29%
2	SHOULDER	73	73%
3	UPPER BACK	9	9%
4	ELBOW	19	19%
5	WRIST /HAND	28	28%
6	LOWER BACK	25	25%
7	HIP/THIGH	20	20%
8	KNEE	42	42%
9	ANKLE/FOOT	28	28%

GRAPHICAL PRESENTATION:

AGE AND GENDER:



NORDIC MUSCULOSKELETAL QUESTIONNAIRE DATA:



DISCUSSION:

Badminton is one of the fastest racquet sports played all over the world, it relaxes the mental stress, but most of the recreational player, plays the game for their happiness and mind relax.

But Elite badminton players have incredible athletic ability and must possess high levels of **speed, agility, strength, flexibility and muscular endurance.**

Characteristics of Badminton:

- Very quick, rapid movement.
- World's fastest racket sport.
- Requires lots of endurance.
- Short rallies (mostly 6-12 seconds)
- High-intensity rallies.

Badminton requires the performance of work in the nature of sprints, stops and starts, jumps, leaps, lunges, rapid changes of direction, twists and turns and a variety of strokes. To become an elite badminton athlete, the fitness requirement is quite specific.

Over the past few years, badminton as played in Asia has focused a greater emphasis on fitness, especially in terms of speed and recovery powers. These may include factors such as technical and perceptual skill, mental power, tactics and aesthetic judgements in the court. Elite badminton athletes' muscle fibers are large and have high capillary density.

A total of 70 players noted shoulder joint as their most injured part throughout their game play. Most of the professional players are less prone to get injury, but unknowingly they can get injury if they overuse the shoulder and other parts of the body. There is a lot of overhead swinging motion in badminton that engages the rotator cuff muscles to execute shots such as the overhead clear, smash or drop. Primarily in clearing and smashing is when high demands are placed on the rotator cuff muscles. Overexerting these muscles and not giving them enough time to recover is a recipe for inflammation, which may further develop into muscle tears.

When a player attempts to hit a shuttle for smash or drive, continuously because of frustration over that point they can easily get injury at the shoulder. Some get injury because of wrong shots due to frustrating game.

To prevent the common injuries in badminton, players need to learn what causes the common injuries, be able to detect early warning signs and symptoms of the common injuries, strengthen the direct and surrounding muscles involved in the common injuries, and finally use and wear proper badminton equipment.

Most of the badminton players motive is to hit the shuttle hard in order to win the match in pressurized situation, because of the game pressure the player has a high chance injuring himself. And also, while playing trick shots his /her extremities may prone to get injure. Here mostly the upper extremity (shoulder, elbow or wrist) is injured as pre the player type of smash (Arm smash, forearm smash, wrist smash).

As per the result of this study the professional badminton players are more prone to the shoulder injury. To avoid this injury the player should follow the strengthening training according to his playing format.

EXERCISE FOR SHOULDER STRENGTHENING:

- TheraBand exercise - Internal and External rotation exercise to strengthening the Rotator cuff muscles.
- Shoulder and Elbow at 90 degrees with TheraBand behind the body and pull the TheraBand forward (15 repetitions with 3 sets). This is to increase smash power and also

prevent the shoulder injury while smashing the shuttle.

- Shoulder and Elbow at 90 degrees with TheraBand this time pull the TheraBand backward (15 repetitions with 3 sets). This is to increase the overhead backhand clearance shot.
- Shoulder is flexed 45 degree and the elbow is at 90 flexed and holding the TheraBand in side and perform external rotation. This is increasing the defense strength (40 repetitions with 3 sets).
- Arm flutters exercises, player in prone position with arm performing extension movements with minimum resistance in his /her hand. (40 repetitions with 3 sets).
- Arm Throw exercise, player in standing position and throws a low weight object such as tennis ball, shuttle, it is to increase the smash coordination and power as well.

The second most common injured part was the knee, mostly the badminton players were more prone to ACL (Anterior Cruciate Ligament) injury, during forward lunges while attempting drop shots near net. And meniscal injuries may also occur during jump smash.

EXERCISE FOR KNEE JOINT INJURIES:

- Wall squats
- Sit to stand
- Forward lunges
- Single leg standing with medicine ball holding

These are some exercises to prevent the injuries around knee joint and shoulder joint.

And also, these types of players should have some psychological talks by the coaches, to reduce the frustrations during and after the match.

CONCLUSION

- 100 elite badminton players were selected to find the percentage of musculoskeletal injuries in specific joint.
- The study resulted showing higher percentage of injury incidence at shoulder and knee joint due to their overuse.

REFERENCES:

1. Musculoskeletal problems in badminton players under 17., et.al, **P Sathya and Iabdhi doshi.**
2. A survey on common injuries in Re-creational badminton players., et.al, **A Muttalib, M Zadi, C Khoo.**
3. The role of core strength training in badminton, et.al, **Mengyao Xie**
4. The effect of 8 weeks core training on dynamic balance of elite level badminton players, et.al, **Oguzhan Yuksel, Sinan Alkin.**
5. Comparison of shoulder strength in routinely trained badminton players and non-badminton players., et.al, **Wong Zhen Feng, Hermawan Nagar Rasyid, Juliati.**
6. Application of core strength training in badminton players., et.al, **Jikang Wang, Juan Cheng.**
7. Injuries in badminton: A Review, et.al., **M.Phomsoupha, G.Laffaye.**
8. **CHEONG HWA OOI** et.al; Physiological characteristics of elite and sub-elite badminton players
9. Badminton injuries, et.al; **K. Kroner MD, S.A. Schmidt MD.**
10. Acute badminton injuries, et.al; **Fahlstrom.M**
11. Badminton injuries in youth competitive players, et.al; **SL Goh, AL Mokhar.**
12. Badminton injuries in elite athletes: A review of epidemiology and biomechanics, et.al; **DN Pardiwala.**
13. Epidemiology of injuries in Hong Kong elite badminton athletes, et.al; **PSH Yung, RHK Chan.**
14. Prevention strategies of badminton injuries, et.al; **MR Mohamed Ali.**
15. Incidence of injuries among amateur badminton player: A cross sectional study, et.al; **A Marchena-Rodriguez.**
16. Mechanism for anterior cruciate ligament injuries in badminton, et.al; **Y Kimura, Y Ishibashi.**
17. Musculoskeletal injury among Malaysian badminton players, et.al; **AH Shariff.**
18. Acute Achilles tendon rupture in badminton players, et.al; **M Fahlstrom.**
19. Risk factor for lower extremity injuries in young badminton players, et.al; **AL Kang, V Ramalingam.**
20. Shoulder pain-a common problem in world class badminton players, et.al; **M Fahlstrom.**
21. Sacral stress fracture in amateur badminton player, et.al; **YYuasa.**
22. A survey of injuries at the 2005 Canadian open master's badminton championship, et.al; **JL Patrick.**
23. The study of sports injuries for younger badminton athletes, **L Kaiwu-Sichuan sports science, 1999**
24. The impact of shoulder injuries on badminton players availability and performance, **c whitam-2013.**
25. A survey of sports injuries in badminton masses and preventive measures **C YE -journal of Liaoning medical university -2014.**