



## International Journal of Physiotherapy Research and Clinical Practice

### Original Article

## Prevalence of Musculoskeletal Injuries in Recreational Volley Ball Players

Akash Indave<sup>1</sup>, Pallavi Chopade<sup>2</sup>, Shilpa Parab<sup>3,\*</sup>

<sup>1</sup>Student, Krupanidhi College of Physiotherapy, Bengaluru, Karnataka, India

<sup>2</sup>Professor, Chaitanya Medical Foundation's College of Physiotherapy, Chinchwad, Pune, Maharashtra, India

<sup>3</sup>Principal, Chaitanya Medical Foundation's College of Physiotherapy, Chinchwad, Pune, Maharashtra, India

#### ARTICLE INFO

##### Article history:

Received 03.06.2022

Accepted 29.06.2022

Published 24.08.2022

\* Corresponding author.

Shilpa Parab

[shilpajayparab@gmail.com](mailto:shilpajayparab@gmail.com)

[https://doi.org/](https://doi.org/10.54839/ijprcp.v1i1.22.13)

10.54839/ijprcp.v1i1.22.13

#### ABSTRACT

Volleyball is one of the most popular sports in the world. Various studies have found musculoskeletal injuries in professional volleyball players, compared to elite players the recreational volleyball players are more subjected to musculoskeletal injuries due to lack of awareness about warm-up, cooldown, proper techniques of the play, and the surface used for playing. The aim of this study is to investigate the prevalence of musculoskeletal injuries in recreational volleyball players using the Nordic musculoskeletal questionnaire. It is an observational study within urban areas including 69 (Male) volleyball players of age group between 18-45 with experience of minimum 3 years. For evaluation Nordic musculoskeletal questionnaire was used, which denoted that there is a prevalence of musculoskeletal injuries observed in recreational volleyball players with highest prevalence in wrist followed by shoulder, elbow, knee, upper back, lower back, neck. This article reviews the specific injuries that are most common as a result of participating in the sport of outdoor volleyball. Reliability for the coefficients of questionnaire was found to be consistent with the Cronbach's Alpha (.761). Conclusion- The present study identified that there is a high prevalence of musculoskeletal injuries in recreational volleyball players (77.5%). Correlation was highly significant with hip / thigh injuries and were associated with shoulder (.416\*\*) wrist / hand (.369\*\*) lower back (.588\*\*) knees (.659\*\*) and ankle / foot (.465\*\*) injuries.

**Keywords:** Volleyball players; Volleyball injuries; Musculoskeletal pain; Musculoskeletal injuries; Outdoor volleyball

#### INTRODUCTION

Volleyball is one of the most popular sports in the world.<sup>1</sup> Volleyball-specific tasks such as jumping, landing, blocking and spiking the ball need to be combined with fast movements, which demands a lot from the musculoskeletal system.<sup>2</sup> As a consequence, volleyball players are at risk for musculoskeletal injuries.<sup>2</sup> Besides its beneficial health effects, volleyball is also associated with a risk for musculoskeletal injuries, either acute or overuse injuries.<sup>3</sup> The incidence of musculoskeletal injuries among volleyball players ranges from 1.7 to 10.7 injuries per 1000 playing hours, occurring mostly in the fingers/wrists, shoulders, knees and ankles.<sup>3</sup> Despite this, volleyball has a high prevalence of low back pain.<sup>4</sup> However, as the physical and mental benefits of doing sports are significant, it is important to prevent musculoskeletal pain in volleyball

players to enable them to continue to play efficiently.<sup>5</sup>

In volleyball there is a significant number of landings following jump movements which are related to high forces in the lower limb joints.<sup>6</sup> Such high forces may cause acute and overuse injuries like anterior cruciate ligament ruptures or patellar tendinopathies respectively.<sup>7</sup>

Musculoskeletal injuries result in significant time loss and limitations for these athletes. Even athletes who are not experiencing time loss may be experiencing limitations in game play. These injuries might induce impairments in daily life, sport and/or work and lead to substantial direct and indirect healthcare costs.<sup>8</sup>

Bahr and Reeser (2003) reported 54 acute injuries (knee 30%, ankle 17%, and finger 17%) in 178 interviewed professional beach volleyball players during a 7.5-week interval of the summer season. More than one third of the players (67 out of 178) reported overuse injuries (back pain

19%, knee pain 12%, and shoulder 10%) for which they received medical attention. A great part of the reported injuries and overuse conditions can be related to high loads in the injured joints during jumping and specifically during landing actions.<sup>7</sup>

It is necessary to have an easy and inexpensive assessment instrument to identify complaints of musculoskeletal disorders among athletes. The requirement for a good assessment instrument is that it has been standardized. These considerations prompted The Nordic Group to develop a standardized questionnaire for the analysis of complaints in musculoskeletal system.<sup>9</sup> Nordic Musculoskeletal Questionnaire is a freely usable public instrument developed by a Nordic Council of Ministers project. This questionnaire can be used to assess musculoskeletal disorders of different parts of the body in epidemiological studies. This questionnaire consists of structured questions that can be used as an interview questionnaire or be filled in by the respondents themselves. There are two parts to the questionnaire: a questionnaire with a general problem assessment that aims to survey in general and a specific section with an assessment that aim for a more in-depth survey. The Nordic Musculoskeletal Questionnaire can be used as an assessment instrument for screening MSDs in an ergonomic context and health care for workers. Nordic Musculoskeletal Questionnaire is a questionnaire used to find out whether someone has problems with their locomotion and daily activities.<sup>10,11</sup>

As per the studies have done it has been found that, there is prevalence of musculoskeletal injuries in professional volleyball players, so these injuries can occur in the recreational group as well.

## METHODOLOGY

The purpose of this study is will help us to recognize whether recreational volley ball players are prone to musculoskeletal injures and also about the intensity with which it can affect them, providing a baseline data for the same in order to consider preventive measures for further studies and the quality of life can be improved as a future concern. With the aim being, to study the prevalence of musculoskeletal injuries in recreational volleyball players using nordic musculoskeletal questionnaire. Participants included were recreational adult volleyball players. In this study 69 participants were chosen from 2 regional volleyball clubs with the inclusion criteria being, minimum 18 years of age or older, playing in a volleyball team competing recreationally in competition, practising volleyball (training and/or match) at least twice a week, and no known history of any kind of injuries as the reason being any fall or accidents (3-6 months prior, other that of volleyball), recent surgeries, any other sports related injuries. Explanatory group meetings were conducted and the coaches of the registered teams were invited for the explanatory group meetings during

which they acknowledged additional information about the purpose and procedures of the study (also additional written information to give to their players). Coaches and players of the enrolled teams gave their informed consent. The procedure of data collection was interview-based questionnaire, where health related data including self-reported medical condition and also the injury type, frequency, duration of injury were gathered.

## PROCEDURE

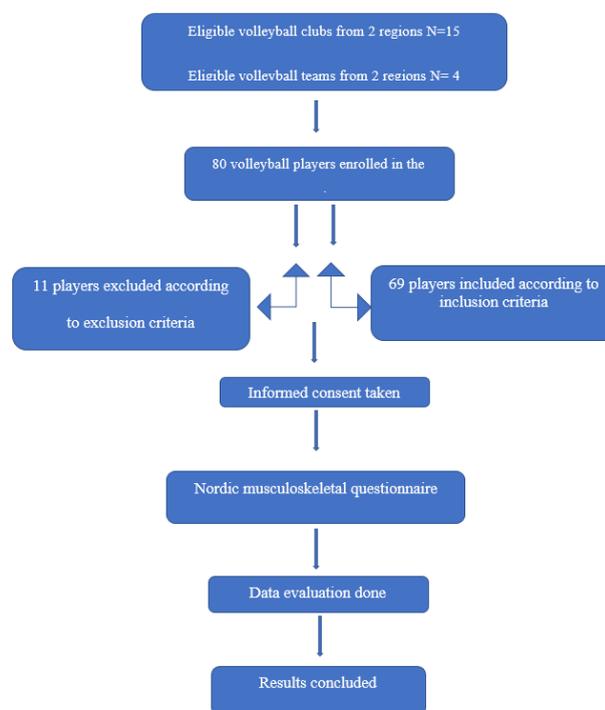


Fig. 1: Recruitment and evaluation flow diagram.

## RESULT

The results are presented in Table 1 and the prevalence of musculoskeletal injuries in recreational volleyball players. It states that there is 77% prevalence of musculoskeletal injuries in recreational volleyball players and 23% do not have any musculoskeletal injury.

It is seen that the areas that are affected are wrist with the highest prevalence of 39% followed by shoulder 36%, elbow 25%, knee 25%, upper back 22%, low back 22%, neck 12%, hip/thigh/buttocks 12% and ankle/foot 12%

## DISCUSSION

This study was done to observe the prevalence of musculoskeletal injuries in recreational volleyball players.

**Table 1: Corelation coefficient**

Spearman's rho	Neck	Shoulders	Upper back	Elbows	Wrist / hands	Lower back	Hips / thighs	knees	Ankle / feet
SHOULDERS			.595**	.359**			.416**		
UPPER BACK		.595**		.441**				.356**	
ELBOWS		.359**	.441**		.482**	.394**			
WRIST / HANDS				.482**		.390**	.369**		
LOWER BACK				.394**	.390**		.588**	.439**	
HIPS / THIGHS		.416**			.369**	.588**		.659**	.465**
KNEES			.356**				.659**		.465**
ANKLE / FEET							.465**	.465**	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

As per Cronbach's Alpha the reliability of the statistics was found to be good. (0.761)

As per the data analysed from the questionnaire, the study shows that there is 77% prevalence of musculoskeletal injuries in recreational volleyball players, of which the musculoskeletal injury with the highest prevalence is found to be present in the wrist with highest prevalence of 39% followed by shoulder 36%, elbow 25%, knee 25%, upper back 22%, low back 22%, neck 12%, hip/thigh/buttocks 12% and ankle/foot 12%.

Considering shoulder injuries and other parts the correlating injuries were found to be upper back, elbow, lower back and hip, athletes with upper back injuries showed correlation with shoulder, elbow and knee injuries, also players found with injuries in the elbow showed relation with upper back wrist and lower back injuries. Similarly, wrist injuries had significance with elbow. Lower back problems were associated with elbow, wrist, hips and knees. Hips and thigh injuries had relation with shoulder, wrist, lower back, ankle and knee injuries. Ankle and foot were associated with hip and knee injuries.

Injuries in volleyball are commonly due to jumping and landing as well as from hitting and blocking the ball. The ball can reach speeds of 80 mph and can cause significant injury should the ball strike an unintended area of a player's body.<sup>12</sup>

More injuries occur during hitting and blocking than during passing or setting. Most injuries, whether acute or overuse in nature, occur during the act of jumping. Overuse injuries are somewhat more common than acute injuries and are due to faulty technique, amount of repetition, or type of playing surface.<sup>12</sup>

There are a lower number of ankle sprains in beach volleyball,<sup>7</sup> which also may be related to the small team size, since with fewer players on the court, there is less chance of landing on someone else's foot. There is a lower incidence of patellar tendinitis in beach volleyball compared with indoor volleyball. This may be because the player cannot jump as high in sand so there is less of an eccentric quadriceps load upon landing. The sand provides a softer landing surface, which also puts less eccentric load on the

quadriceps tendon.<sup>12</sup>

A number of injury risk factors have been identified, e.g., techniques (movement patterns) of jumping, landing and hitting, hardness of the playing surface, shock absorbency of shoes, level of physical conditioning.<sup>13</sup>

Compared to the other sports volleyball players had a higher frequency of injuries to the hands or fingers (45%/25%) and ankle (31%/20%), but fewer injuries located in the other anatomical regions.<sup>14</sup>

There was a clear positive relationship between playing surface and incidence of injury - the harder the playing surface the higher the incidence of injury.<sup>13</sup>

In this study common mistakes made by recreational volleyball players are the incorrect techniques used during the game, lack of understanding about the air pressure within the ball, ignorance towards warm up and cool down, incorrect foot wear uses during the game.

During the study it was also found that players having chronic injuries show acute symptoms of injury as well and majority of the players do not perform regular warm up and also do not take any kind of treatment after occurrence of injury.

**CONCLUSION**

It is concluded that there is high prevalence of musculoskeletal injuries, that is 77% in recreational volleyball players majorly present in the wrist followed by shoulder, elbow, knee, upper back, lower back, neck, hip/thighs/buttocks and then ankle/foot.

**ACKNOWLEDGMENTS**

We greatly thank all volleyball trainers / coaches and players for their participation in the study.

**REFERENCES**

- Gouttebarga V, Van Sluis M, Verhagen E, Zwerver J. The prevention of musculoskeletal injuries in volleyball: the systematic development of an intervention and its feasibility. *Injury Epidemiology*. 2017;4(25). Available from: <https://doi.org/10.1186/s40621-017-0122-y>.



2. Kilic O, Maas M, Verhagen E, Zwerver J, Gouttebauge V. Incidence, aetiology and prevention of musculoskeletal injuries in volleyball: A systematic review of the literature. *European Journal of Sport Science*. 2017;17(6):765–793. Available from: <https://doi.org/10.1080/17461391.2017.1306114>.
3. Bahr R, Bahr IA. Incidence of acute volleyball injuries: a prospective cohort study of injury mechanisms and risk factors. *Scandinavian Journal of Medicine & Science in Sports*. 1997;7(3):166–171. Available from: <https://doi.org/10.1111/j.1600-0838.1997.tb00134.x>.
4. Hangai M, Kaneoka K, Okubo Y, Miyakawa S, Hinotsu S, Mukai N, et al. Relationship between low back pain and competitive sports activities during youth. *The American journal of sports medicine*. 2010;38:791–797. Available from: <https://doi.org/10.1177/0363546509350297>.
5. Mizoguchi Y, Akasaka K, Otsudo T, Hall T. Factors associated with low back pain in elite high school volleyball players. *Journal of Physical Therapy Science*. 2019;31(8):675–681. Available from: <https://doi.org/10.1589/jpts.31.675>.
6. Bisseling RW, Hof AL, Bredeweg SW, Zwerver J, Mulder T. Relationship between landing strategy and patellar tendinopathy in volleyball. *British Journal of Sports Medicine*. 2007;41(7):e8. Available from: <https://doi.org/10.1136/bjism.2006.032565>.
7. Bahr R, Reeser JC. Injuries among world-class professional beach volleyball players: the Federation Internationale de Volleyball beach volleyball injury study. *The American journal of sports medicine*. 2003;31:119–125. Available from: <https://doi.org/10.1177/03635465030310010401>.
8. Verhagen EA, Van Tulder M, Van Der Beek AJ, Bouter LM, Van Mechelen W. An economic evaluation of a proprioceptive balance board training programme for the prevention of ankle sprains in volleyball. *British Journal of Sports Medicine*. 2005;39(2):111–115. Available from: <https://doi.org/10.1136/bjism.2003.011031>.
9. Kuorinka I, Jonsson B, Kilbom A, Vinterberg H, Biering-Sorensen F, Andersson G, et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Applied Ergonomics*. 1987;18(3):233–237. Available from: [https://doi.org/10.1016/0003-6870\(87\)90010-x](https://doi.org/10.1016/0003-6870(87)90010-x).
10. Kahraman T, Genç A, Göz E. The Nordic Musculoskeletal Questionnaire: cross-cultural adaptation into Turkish assessing its psychometric properties. *Disability and Rehabilitation*. 2016;38(21):2153–2160. Available from: <https://doi.org/10.3109/09638288.2015.1114034>.
11. Sekaaram V, Luh A, S. The prevalence of Musculoskeletal Disorders (MSDs) in public transport drivers at the Mengwi terminal. *Intisari Sains Medis*. 2017;8(2):118–124. Available from: <https://doi.org/10.15562/ism.v8i2.125>.
12. Eerkes K. Volleyball injuries. *Current sports medicine reports*. 2012;11:251–257. Available from: <https://doi.org/10.1249/JSR.0b013e3182699037>.
13. Watkins J, Green BN. Volleyball injuries: a survey of injuries of Scottish National League male players. *British Journal of Sports Medicine*. 1992;26(2):135–137. Available from: <https://doi.org/10.1136/bjism.26.2.135>.
14. Solgård L, Nielsen AB, Møller-Madsen B, Jacobsen BW, Yde J, Jensen J. Volleyball injuries presenting in casualty: a prospective study. *British journal of sports medicine*. 1995;29(3):200–204. Available from: <https://doi.org/10.1136/bjism.29.3.200>.