Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 6 (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Prevalence Of Musculoskeletal Problems Among Female Throwball Players

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Cite this paper as: Raveena Thilagam. S, Murugaraj. T, Shanmugananth Elayaperumal, Jannathul Firthous. M, Subashini. G, (2025) Prevalence Of Musculoskeletal Problems Among Female Throwball Players. *Journal of Neonatal Surgery*, 14 (6), 103-109.

ABSTRACT

Background: Throwball is a popular sport, especially in India, where it is often played by women at various levels, from schools and colleges to competitive leagues. It is a fast-paced, team sport that combines elements of volleyball and basketball, offering a unique and exciting playing experience. It is primarily played by women. These players are highly susceptible to injuries due to repetitive throwing actions of the shoulder.

Objective: To study the site of musculoskeletal pain in female throwball players.

Methodology: A cross-sectional study was conducted on 50 throwball players. A convenient sampling method was used on the subjects. Only female players were included and players having the age group between 18 to 28 years with a minimum of 1 year of experience of playing the game participated in the study. The study was conducted using the Nordic Musculoskeletal Questionnaire.

Result: The most painful sites are the shoulder joint (92%) and upper back (50%), whereas the least painful are the lower back (20%), hips and thighs (20%), and ankle joint (24%).

Conclusion: In this study, according to the results and discussion it is concluded that the players are experiencing musculoskeletal pain maximum in the shoulder joint (92%) and minimal in the lower back (20%).

Keywords: *Female throwball players, Musculoskeletal pain, Nordic musculoskeletal questionnaire*

1. INTRODUCTION

The fast-paced, non-contact team sport known as throwball has its roots in India. It is comparable to volleyball, but the regulations and gameplay are different. The object of the game is for two teams of seven players each to use their hands alone to pass the ball over a net. The goal is to toss the ball into the court of the opposition so they can't grab it and return it. In South Asian nations, throwball is highly well-liked, especially in schools and universities. It fosters agility, rapid reflexes, and teamwork. Participants in throwball must catch and toss the ball without holding it for longer than three seconds, in contrast to volleyball, where the ball is hit or spiked[1,2,3]. Throwball is a well-liked team activity that demands quickness, agility, and accurate hand-eye coordination, particularly among female participants. It requires tossing, jumping, and changing direction quickly, all of which put a lot of strain on the musculoskeletal system.

Women's participation in throwball sports has grown significantly over the years. The sport provides opportunities for women to engage in physical activity, teamwork, and competition. Throwball is especially popular in women's colleges and sports clubs because of its relatively simple rules and the limited need for heavy equipment. Women's throwball is governed by national federations in countries like India, where it has achieved a significant following. Tournaments and

championships are regularly held, and the sport continues to grow in popularity across other countries as well. The focus of the game, throwball is on throwing and catching skills, and it is played on a rectangular court between two teams. Catching requires the use of both hands, and the ball must be launched from above the shoulder line. Because throwing is emphasized in the game, shoulder strength becomes essential to succeed in throwball [1]

Throwball requires significant shoulder strength, particularly during serves and overhead throws. Women may face challenges related to shoulder strength due to differences in muscle mass and upper body strength compared to men. This can increase the risk of shoulder injuries, such as rotator cuff strain or impingement. Inadequate training or improper technique can exacerbate this issue. Research has shown that women, especially those not engaging in regular strength training, may have less developed upper body strength, which can hinder their ability to perform at the highest levels in throwball (Kumar et al., 2019) [11]

Despite being a non-contact sport, throwball puts female players at risk for musculoskeletal injuries because of things like biomechanical stress, repeated strain, and poor training methods. Throwball frequently results in musculoskeletal injuries that impact bones, muscles, ligaments, and tendons. Shoulder injuries (rotator cuff strains, impingement syndrome) brought on by repeated throwing motions are among the most common ailments. Knee problems brought on by abrupt leaps and landings, such as patellar tendinitis and tears in the anterior cruciate ligament (ACL). Fractures and sprains of the ankle brought on by abrupt changes in mobility. Spine injuries and lower back pain brought on by bad posture and prolonged stress[4,5]. So, the main objective of this study is to find out the prevalence of musculoskeletal problems among female throwball players [6] . Throwing events need a lot of force and energy. The athlete attempts to produce a larger amount of external mechanical power generated by the muscle to move the body and throw the ball. [7]

2. METHODOLOGY

Study design: This study was a cross-sectional study. **Sample size:** 50. **Study setting:** 50 female throwball players from Mahatma Gandhi Medical College, Puducherry. **Study method:** All participants were selected by convenient sampling method. **Inclusion criteria:** The players' age range is between 18 to 28, and includes only female players. The players should be involved in playing throwball 2 to 3 days a week and with at least 1 year of experience. **Exclusion criteria:** Players who had recent injuries, and players not give consent are excluded from this study. **Outcome measure:** Nordic musculoskeletal questionnaire

3. PROCEDURE

The focus of the study was to find out the site of musculoskeletal pain in female throwball players. The study's purpose and procedure were clearly explained to the participants and informed consent was taken. Players were asked to fill assessment form which included: Demographic data, years of experience, number of days of practice per week, and hours of practice per session. Demographic data included name, age, weight, Height and BMI. The Nordic musculoskeletal questionnaire was used for data collection. Players were then explained about the Nordic Musculoskeletal Questionnaire and asked to fill it which was circulated through Google Forms. The Nordic Musculoskeletal Questionnaire (NMQ) is a standardized tool used for assessing musculoskeletal symptoms in different body regions. The structure of this questionnaire covers nine body regions: neck, shoulders, upper back, lower back, elbows, wrists/hands, hips/thighs, knees, and ankles/feet. It includes yes/no questions about musculoskeletal symptoms in the past 12 months and the past 7 days [8] . The questionnaire helps in detecting the prevalence and distribution of MSDs across different body regions. Helps in detecting MSDs in high-risk areas for throwball players, such as the shoulders, elbows, wrists, lower back, and knees. Assesses pain, discomfort, and functional limitations due to repetitive throwing, jumping, and sudden movements. Data were collected and analyzed.

4. RESULTS

The results convey that in the past 12 months, the players have experienced Musculoskeletal pain maximum in the shoulder joint (92%) and upper back (50%), and minimal in the lower back (20%), hips and thighs (20%)and ankle joint (24%). Whereas activity prevented pain indicated that the maximum was Shoulder (92 %) and minimum in the ankle (16%). Pain in the past 7 days was maximum in the shoulder (88%) and minimum in the hips /thighs and lower back (16%)

5. STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the data collected in simple numerical form using MS Excel. The data was then statistically analyzed and presented in the form of pie charts and bar diagrams. A total of 50 responses were collected from female throwball players

FIGURE 1: AGE DISTRIBUTION OF FEMALE THROWBALL PLAYERS

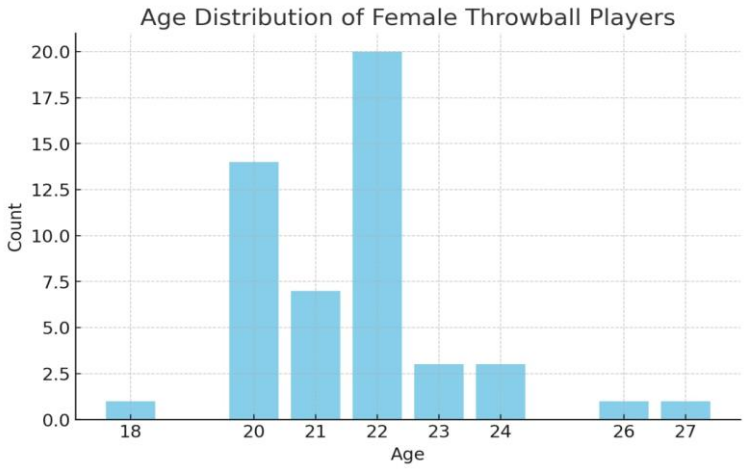

TABLE 1: AGE DISTRIBUTION OF FEMALE THROWBALL PLAYERS

AGE	NUMBER OF PLAYERS
18	1
20	14
21	7
22	20
23	3
24	3
26	1
27	1

The age distribution of female throwball players in the dataset shows that the majority are 22 years old (20 players), followed by 20 years old (14 players) and 21 years old (7 players). There are also a few players aged 18, 23, 24, 26, and 27, with only one player each at 18, 26, and 27 years. This indicates that most participants are in their early twenties, suggesting that throwball is predominantly played by younger athletes in this group.

FIGURE 2 : : MUSCULOSKELETAL PAIN IN FEMALE THROWBALL PLAYERS IN LAST 12 MONTHS :

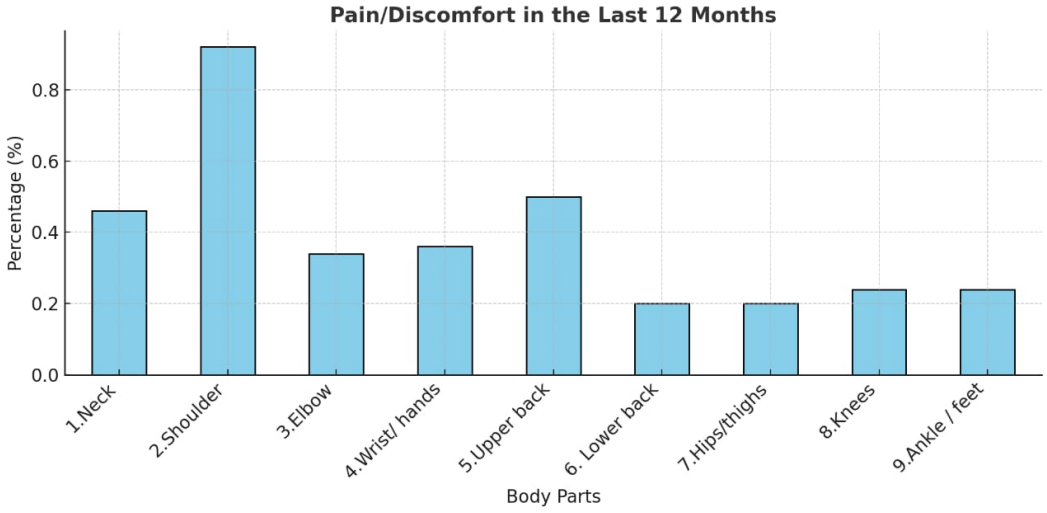

TABLE 2 : MUSCULOSKELETAL PAIN IN FEMALE THROWBALL PLAYERS IN LAST 12 MONTHS :

BODY PART	FREQUENCY	PERCENTAGE	RELATIVE PERCENTAGE
Neck	23	46%	13.29%
Shoulder	46	92%	26.59%
Elbow	17	34%	9.83%
Wrist/Hands	18	36%	10.40%
Upper back	25	50%	14.45%
Lower back	10	20%	5.78%
Hips/thighs	10	20%	5.78%
Knees	12	24%	6.94%
Ankles/feet	12	24%	6.94%

The table presents data on the frequency and percentage of musculoskeletal pain in female throwball players in the last 12 months in different body parts. The shoulders have the highest frequency (46 players, 92%), followed by the upper back (25 players, 50%) and neck (23 players, 46%). The elbows, wrists/hands, knees, and ankles/feet show moderate occurrences, ranging between 24% to 36%. The lower back and hips/thighs have the lowest frequency (10 cases each, 20%). The relative percentage column provides a comparative measure of each body part's occurrence about the total cases, with shoulders being the most affected (26.59%) and lower back/hips/thighs the least (5.78%).

FIGURE 3 : ACTIVITY OF FEMALE THROWBALL PLAYERS AFFECTED DURING 12 MONTHS DUE TO PAIN

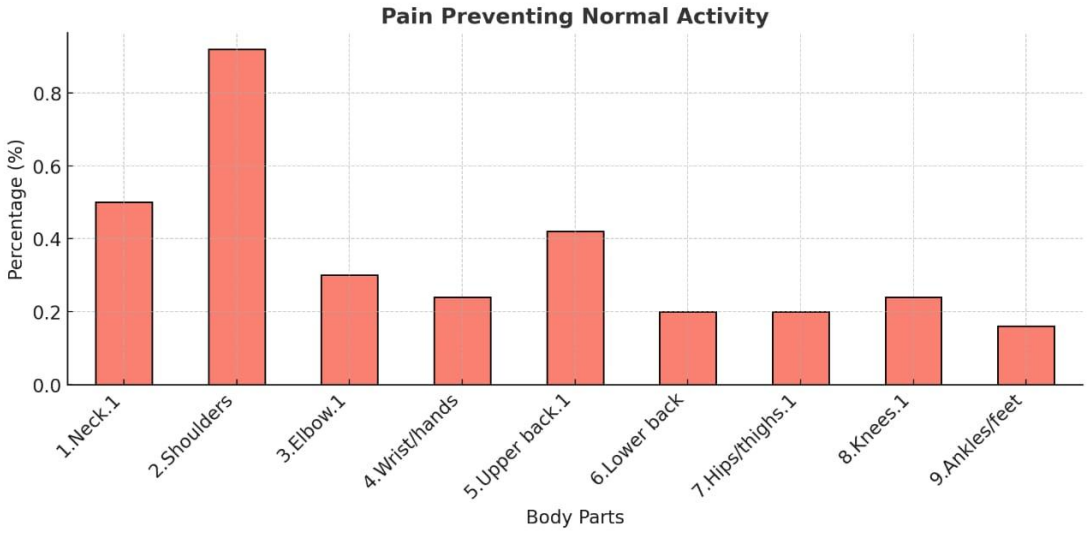

TABLE 3 : ACTIVITY OF FEMALE THROWBALL PLAYERS AFFECTED DURING 12 MONTHS DUE TO PAIN

BODY PART	FREQUENCY	PERCENTAGE	RELATIVE PERCENTAGE
Neck	25	50%	15.72%
Shoulder	46	92%	28.93%
Elbow	15	30%	9.43%
Wrist/Hands	12	24%	7.55%

Upper back	21	42%	13.21%
Lower back	10	20%	6.29%
Hips/thighs	10	20%	6.29%
Knees	12	24%	7.55%
Ankles/feet	8	16%	5.03%

The table provides data on the frequency and percentage of activity of female throwball players across different body parts. Shoulders are the most affected, with 46 players (92%), followed by the neck (25 players, 50%) and upper back (21 players, 42%). The elbow, wrists/hands, knees, and ankles/feet show moderate occurrences, ranging from 16% to 30%. The lower back and hips/thighs have the lowest frequency (10 players each, 20%). The relative percentage column highlights the proportion of each body part's occurrence relative to the total, with shoulders being the most affected (28.93%) and ankles/feet the least (5.03%)

FIGURE 4 : MUSCULOSKELETAL PAIN EXPERIENCED BY PLAYERS IN LAST 7 DAYS :

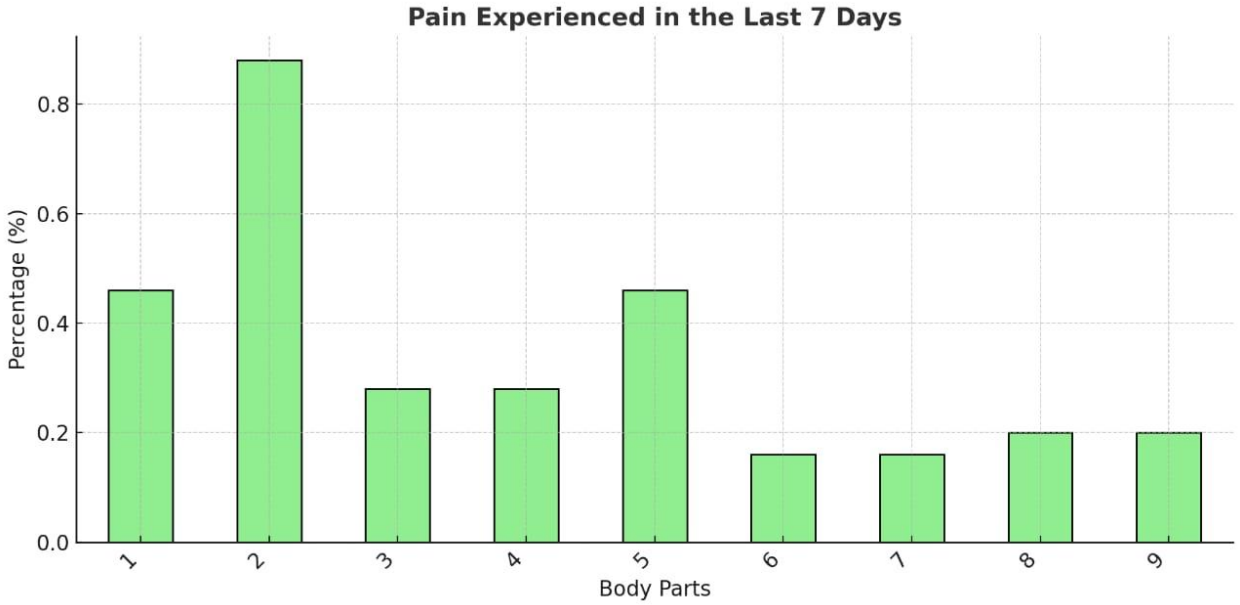

TABLE 4: MUSCULOSKELETAL PAIN EXPERIENCED BY PLAYERS IN LAST 7 DAYS:

BODY PART	FREQUENCY	PERCENTAGE	RELATIVE PERCENTAGE
Neck	23	46%	14.94%
Shoulder	44	88%	28.57%
Elbow	14	28%	9.09%
Wrist/Hands	14	28%	9.09%
Upper back	23	46%	14.94%
Lower back	8	16%	5.19%
Hips/thighs	8	16%	5.19%
Knees	10	20%	6.49%
Ankles/feet	10	20%	6.49%

The table presents data on the frequency and percentage of musculoskeletal pain experienced by female throwball players in the last 7 days across different body parts. Shoulders are the most affected, with 44 players (88%), followed by the neck and upper back (23 players each, 46%). Elbows and wrists/hands have moderate occurrences (14 players each, 28%), while the knees and ankles/feet show 20% occurrence. The lower back and hips/thighs have the lowest frequency (8 players each, 16%). The relative percentage column shows the proportion of each body part's occurrence relative to the total, with shoulders (28.57%) being the most affected and lower back/hips/thighs (5.19%) the least.

6. DISCUSSION

This study focuses on the musculoskeletal pain in female throwball players. It tells us which musculoskeletal site is the most painful in throwball players due to the technique required for throwing. The study was conducted on 50 female throwball players, using the Nordic Musculoskeletal Questionnaire, of 50 females.

The population in this study Ranges between the ages of 18 to 28 years, the mean standard deviation of the respondents is 21.58 years. Among the 50 participants, it was found that the prevalence of musculoskeletal pain was highest in the shoulder joint (92%) and upper back (50%), whereas the least painful is the lower back (20%), hips and thighs (20%) and ankle joint (24%).

In previous studies, it was concluded that Shoulder pain was commonly found in 20-year-old throwing athletes. Many athletes with overhead throwing activities were not suffering from pain but few participants were suffering from mild to moderate shoulder pain, most commonly, the right shoulder was involved[9].

The shoulder joint is the most involved joint during the throwball game. Shoulder pain is most common in throwball players because they lack systematic practice and proper training. Some possible causes of shoulder injury include inadequate skill level, wrong movements, lack of warm-up, muscle imbalance, and stiff muscles. Adapting the abnormal biomechanics while playing results in repetitive trauma to the shoulder. Thus, the constant pain leads to a decrease in the performance of the players was discussed in the study named CROSS-SECTIONAL SURVEY OF MUSCULOSKELETAL PAIN IN SHOT-PUT PLAYERS USING NORDIC MUSCULOSKELETAL QUESTIONNAIRE[10].

In a previous study from Germany, handball athletes were investigated to recognize shoulder pain as a substantial problem in the last six months. They showed that 40% of athletes lost their time from training due to problems occurring in the shoulder. That study was on female handball players and showed that a large number of players had shoulder pain [12]. A study by Singh et al. (2018) found that 40% of female throwball players experienced some form of musculoskeletal injury, with 30% of these injuries leading to prolonged periods of rest or treatment. This high prevalence underscores the importance of injury prevention strategies tailored to the specific demands of sport [13]. Additionally, research indicates that the incidence and prevalence of musculoskeletal disorders are higher in female handball players, emphasizing the need for targeted prevention and rehabilitation. [14]

7. CONCLUSION

The study concludes that there is a high prevalence of musculoskeletal pain among female occurrences in the lower back (20%), hips/thighs (20%), and ankle (24%). Pain interfering with activity was most common in the shoulder (92%) and least in the ankle (16%). In the past week, shoulder pain remained highest (88%). To prevent such issues, targeted strength training, flexibility exercises, proper warm-up routines, and ergonomic technique modifications should be emphasized. Regular physiotherapy, adequate rest, and the use of supportive gear can also reduce injury risks and enhance performance longevity.

8. CLINICAL IMPLICATION

• This study will be a baseline for further researchers to study how to overcome the site of pain in throwing game players.

• It will help further researchers to set rehabilitation interventions and protocols to overcome musculoskeletal pain in female throwball players.

9. ACKNOWLEDGEMENTS

The study acknowledges: Mahatma Gandhi Medical College and Research Institute, Puducherry, for providing the study setting. Participants who consented to share their experiences and data.

AUTHOR CONTRIBUTION: All authors equally contributed

FUNDING SOURCES: No funding sources

CONFLICT OF INTEREST: No conflicts of interest

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