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**INCIDENCE OF SHOULDER PAIN AND DISABILITY IN UNDER 19  
BADMINTON PLAYERS IN NAVI MUMBAI USING SHOULDER PAIN  
AND DISABILITY INDEX: A SURVEY**<sup>p.p:11-20</sup>



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**ABSTRACT**

A cross-sectional survey study was conducted in order to determine the incidence of shoulder pain and disability among Badminton players of Navi Mumbai from 'under19' category of age group. A total of 100 male and female players within 12-19 years of age were recruited randomly from four Badminton academies across Navi Mumbai, Maharashtra. The Shoulder Pain And Disability Index was administered for data collection. The responses collected, were then statistically analyzed using MS-Excel to obtain the results. The study concluded that, Pain and Disability increase with increasing playing experience, with 12% of the participants complaining of pain and disability. The data obtained from this research can be used to form judgments regarding pain amongst young elite players, furthermore, structuring a detailed training and rehabilitation program for them. A comparative study between elite and recreational players with respect to shoulder joint can be done further.

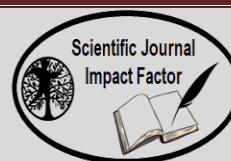
**Keywords:** Shoulder Pain, Disability Index & Badminton Players.

**INTRODUCTION**

Badminton is one of the most widely played sports in the world. The BWF estimates that about 150 million people play the game worldwide.<sup>[1]</sup> According to the BAI guidelines for competition regulation, the players are divided under seniors, juniors (under19 years), Sub-juniors (under 16 years), Midgets (under 13 years), and mini (under 10 years) categories with regards to their age, while participating in a competitive



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tournament.<sup>[2]</sup> The sport consists of broadly two categories viz., the singles and the doubles categories, where the doubles category further includes mixed doubles. Players compete individually in singles category while they partner up for the doubles. Hence, doubles players possess additional risk of injury due to accidents happening amongst the partners.

Badminton is considered a relatively safe sport. A study conducted on elite as well as recreational players, in Europe, found to have an injury rate of 2.9 injuries/player/1000 badminton hours. The prevalence of injuries was 0.3 injuries per player.<sup>[3]</sup> Despite this, badminton carries a certain amount of injury burden.


It requires repetitive overhead motion with the shoulder in abduction and external rotation while the wrist is in extension. Overhead shots are estimated to constitute 30% of shots played by badminton players (unpublished study data from International Badminton Federation), with female players having a higher percentage of overhead shots compared to their male counterparts.<sup>[4]</sup> According to a study conducted on elite badminton players in Hong Kong, shoulder injuries accounted for 19% of all the musculoskeletal injuries involved in the study.<sup>[5]</sup> Another survey study conducted on 188 elite international badminton players in 2003 concluded that, 52% of the players reported previous or current shoulder pain on the dominant side while playing, where 37% of the players reported previous shoulder pain while 20% of them reported current pain.<sup>[4][6]</sup>

Over half of badminton players, both recreational and elite, have a previous or current painful shoulder but many continue to play despite it. At any given point in time, roughly 1 in 5 players have ongoing shoulder pain, comparable to norms in the general population.<sup>[4]</sup> This pain contributes to decline in performance of the players. Hence, it becomes important to assess and manage the pain for performance enhancement of the players.

The Shoulder Pain and Disability Index (SPADI) is a self-reported questionnaire designed to assess pain and disability in individuals with shoulder pathology. It consists of 13 items divided into two subscales: Pain (5 items) and Disability (8 items). It is used in a variety of overhead athletes, as well as patients with rotator cuff tears, shoulder

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 **UAE**

 **GERMANY**

Page 12

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impingement syndromes, adhesive capsulate, and shoulder instability. Interpretation of SPADI depends upon the specific study or clinical context.<sup>[7]</sup>

This study focuses on injury-related pain and the associated disability of the shoulder joint among players of the junior, sub junior and midget categories.

**OBJECTIVE OF THE STUDY**

The objective of this study was to examine the incidence of shoulder pain and disability in under 19 badminton players in Navi Mumbai.

**HYPOTHESIS**

- Alternate hypothesis (H1): There is shoulder pain and disability in under 19 badminton players.
- Null hypothesis (H0): There is no shoulder pain and disability in under 19 badminton players.

**DESIGN OF THE STUDY**

A cross-sectional study was conducted. The data was collected from badminton academies across Navi Mumbai. A total of 100 Badminton players were selected on the bases of convenience sampling method. The age group of 12-19 years were recruited in the present study. On getting approval from the Institutional Ethics Committee of TMV's Lokmanya Tilak College of Physiotherapy, Kharghar, permission was obtained from Coaches of the respective Badminton Academies to conduct the study. The subjects were interviewed for their demographic details viz., Name, Age, Gender, playing experience, etc.; subsequently screening was done for the exclusion criteria. Data collection was carried out using Shoulder Pain and Disability Index. The questionnaire assesses two factors i.e., Pain and Disability associated with it in the shoulder joint. The frequency and percentage of the collected data were obtained and presented in the form of tables and charts using Microsoft Excel.

**Tools for Data Collection:** The Shoulder Pain and Disability Index was used to collect responses of the players along with the Demographic data collection sheet.

**STATISTICAL ANALYSIS**

The objective of this study is to examine the incidence of pain and disability of the shoulder joint among under 19 badminton players in Navi Mumbai with Shoulder Pain

 -INDIA

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 ADVANCED SCIENCE INDEX -GERMANY

Page 13

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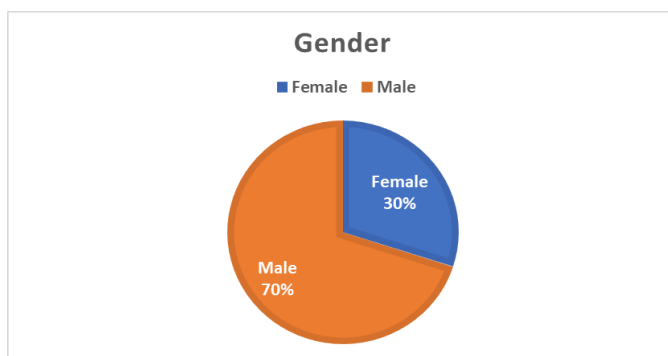
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and Disability Index. A total of 100 players under the age of 19 years participated in the study where Male participants were 70(70%) and Female participants were 30(30%).

**Table no.1 – Frequency and percentage of gender of participants**

Gender	Frequency (n=100)
Male	70 (70%)
Female	30 (30%)



**Figure no.1- Frequency and percentage of gender of participants.**

Number of male participants was found to be more than number of female participants.

Among 100 candidates, maximum number of participants were from the age group of 12-13 years

(i.e.43), while minimum number of participants was from the age group of 18-19 years (i.e.8). Participants in the age group of 14-15 years were 27 while those within the age range of 16-17 were 22. Mean age of participants was  $14.31 \pm 1.96$  years.

**Table no.2- Frequency and percentage of age of participants**

Age ranges (in years)	Frequency (%) (n=100)
12-13	43 (43%)
14-15	27 (27%)
16-17	22 (22%)
18-19	8 (8%)

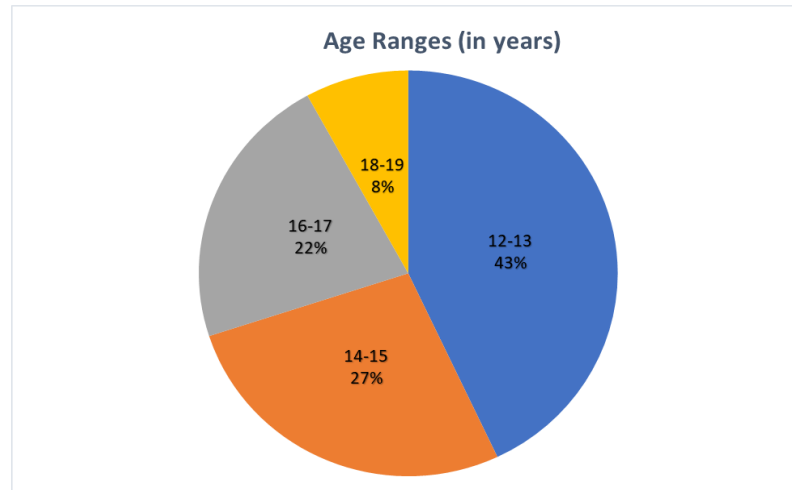
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**Figure no.2- Frequency and percentage of age of participants.**

The study showed that 44% of the total participants had minimum years of experience (i.e.1-1.9 years), 17% participants had 2-2.9 years of playing experience, 13% players had 3-3.9 years of playing experience, 8% participants had 4-4.9 years of paying

experience, while same percentage of participants had 5-5.9 years of playing experience, 3% participants had 6-6.9 years of experience and 7% participants had 7-7.9 years of playing experience. Mean of playing experience was 2.628±1.8 years.

**Table no.3- Frequency and percentage of playing experience (in years)**

Playing experience	Number of participants (n=100)
1-1.9	44
2-2.9	17
3-3.9	13
4-4.9	8
5-5.9	8
6-6.9	3
7-7.9	7



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Page 15

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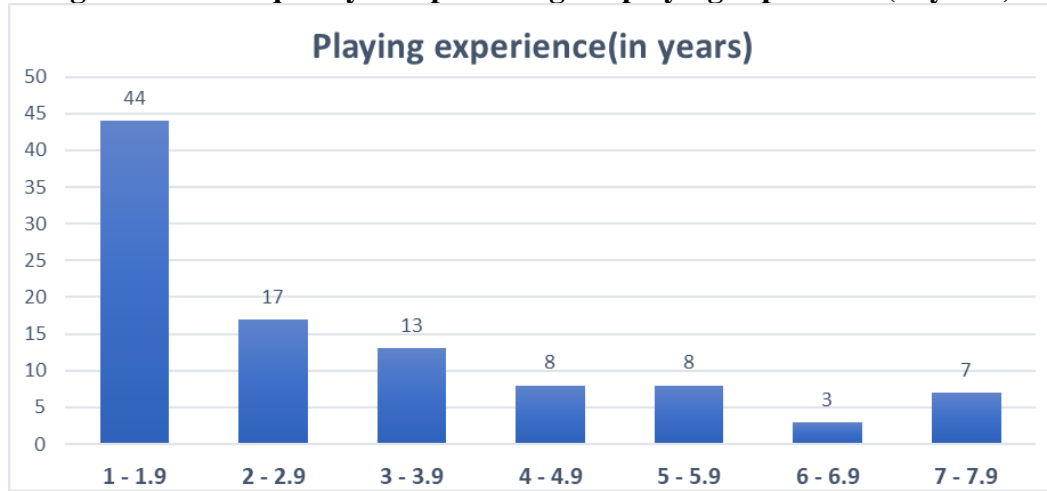
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**Figure no.3- Frequency and percentage of playing experience (in years).**



According to the data obtained, Mean value of Pain score was 8.44 while Mean value of disability score was 5.48.

**Table no.4 - Mean Pain score and Disability score.**

Outcome Measures	Mean Value
Pain score	8.44
Disability score	5.48

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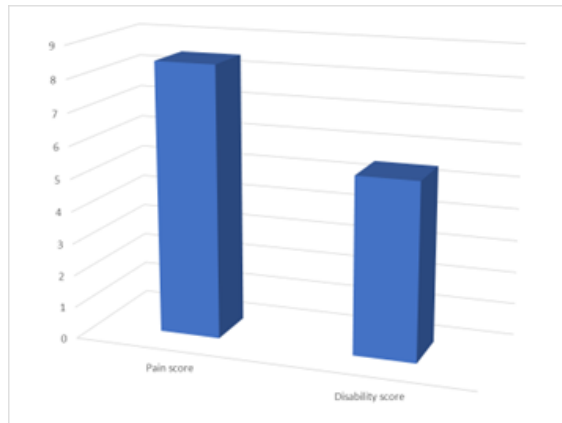
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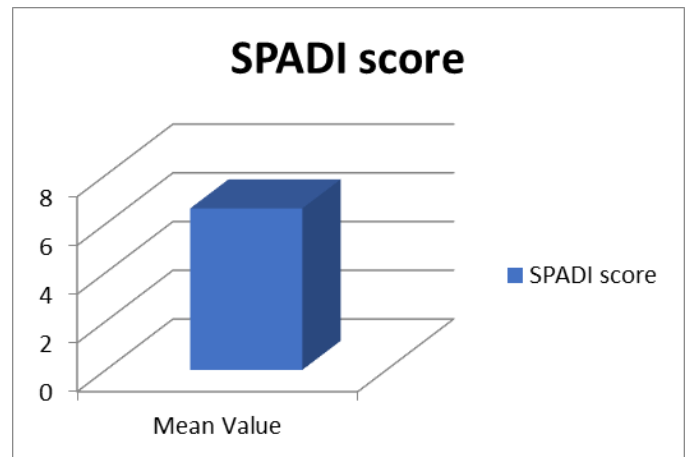
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**FIGURE NO.4- Mean Pain score and Disability score.**



Mean value of reported pain was relatively higher to that of the disability.

**FIGURE NO.5- Mean of total SPADI score.**

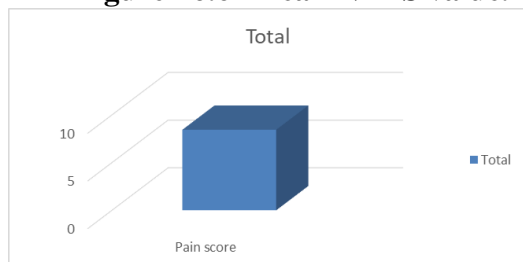


**Table no.5- Mean of total SPADI score.**

Outcome Measure	Mean Value
SPADI score	6.62

Mean of all the NPRS scores was found to be 8.44.

**Figure no.6- Mean NPRS value.**



**Table no.6- Mean NPRS value.**

Outcome Measure	Mean Value
Pain Score	8.44

Based on the SPADI score interpretation, maximum (92%) percentage of the population reported mild pain and disability. Whereas, 2%(n=2) of the participants reported moderate pain and disability, 5%(n=5) of them



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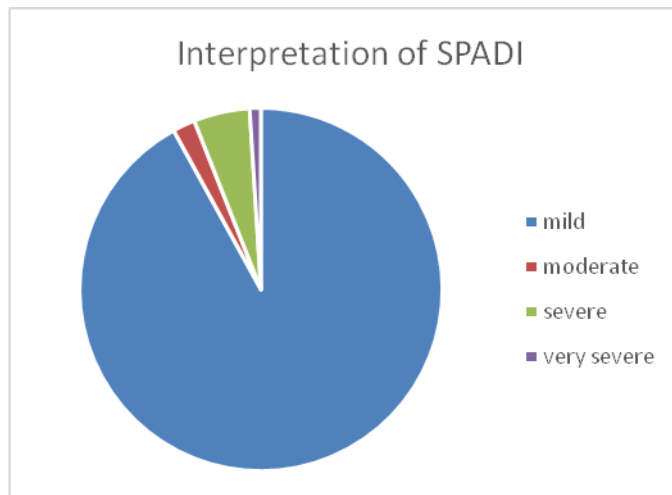
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reported severe pain and disability, and only 1%(n=1) of the participants reported to have very severe pain and disability. None of the participants reported extremely severe pain and disability.

**Table no.7- Frequency and percentage of SPADI interpretation**

Interpretation	Frequency (%) (n=100)
Mild	92 (92%)
Moderate	2 (2%)
Severe	5 (5%)
Very severe	1 (1%)
Extremely severe	0

**Figure no.7- Frequency and percentage of SPADI interpretation**



Discussion- The present study included 100 competitive level badminton players within the age group of 12-19 years with the mean age being 14.31±1.96 years, who play badminton for an average of 2.628±1.8 years. The mean pain score was 8.44 out of 10 according to NPRS. During the overhead throwing/hitting motion, the shoulder complex functions as a regulator of forces generated by the legs and the trunk.[4][9] It is

this regulating function as well as the high velocities that accompany the hitting motion that places large forces across the glenohumeral joint. [4][10] The forces as well as the frequent repetition of the overhead hitting action produce severe stresses on the muscles,



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bones, and joints of the upper extremity. [4][11] The mean disability score was 5.49 out of 10. Shoulder pain and impingement of the rotator cuff caused by anterior instability of the shoulder are frequent problems for athletes engaged in overhead sports.[4] Repetitive overhead activities likely lead to adaptation to the pillars that constitute the shoulder joint- the bones (including scapula), the cuff, and the muscle stabilizers. [4] [12] This adaptation and instability of the joint may be the contributors to disability in shoulder joint. The average SPADI score was 6.626. Score interpretation of SPADI showed that maximum (92%) percentage of the participants reported mild pain and disability. The primary reason for this might be that a major chunk of the sample population consisted of players with minimum years of experience (i.e., 1-1.9 years). This applies that minimum playing experience exposes patient to less amount of microtrauma caused by wear and tear of the shoulder stabilizers, hence reduced chances of developing persisting pain causing pathologies. The remaining 8% of the population, that consists of players having more playing experience reported moderate, severe, and very severe pain and disability. Among the total 100 participants, 70% were male players, while 30% of them were female players. According to a review of studies done on badminton players, there was no difference for shoulder pain prevalence or shoulder kinematics between male and female players.[4] Contrasting to this, a Dutch kinetic study of rotator cuff found difference in shoulder kinematics between male players and female players. [12]There appears to be increase in Pain and Disability with the playing experience. This might be because of the increased amount of exposure period to the injuries and subsequent micro trauma to the anatomical structures of the joint. Overall, most of the times players continue to play through the pain, given the pain intensity is low.


**CONCLUSION**

The study concluded that, Pain and Disability increases with increasing playing experience with 12% of the participants complaining of pain and disability.


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 -INDIA

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 -UAE

 -GERMANY

Page 19

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Page 20

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