

Comparison Of Prevalence Of Neck Pain In Elite And Recreational Swimmers In Navi Mumbai

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Abstract

Introduction: Swimming is one of the most popular recreational and competitive sporting activities. Swimming requires highly repetitive upper extremity overhead movements to provide the majority of the propulsive forces for all four main strokes: free-style, butterfly, breaststroke and backstroke. This leads to an increased risk of sustaining an injury, particularly musculoskeletal soft tissue injuries, among swimmers. The neck is also subjected to sustained and repetitive movements, which can have implications for overuse injury. Neck over-rotation loads cervical spine ligaments and muscles, which encourages asymmetrical development. Neck pain (NP) is a common musculoskeletal problem with a lifetime prevalence of 14%–70% in the general population. Elite swimmers participate in International/National/Regional competitions and Recreational swimmers participate in swimming for fitness activity and participate in local swimming competition.

Aim: To compare the prevalence of neck pain in elite and recreational swimmers.

Material And Method: This Descriptive study included 156 Elite and Recreational Swimmers of Navi Mumbai, India. Prevalence of neck pain in swimmers is assessed with the help of 'Self-made validated questionnaire for Swimmers' was provided to each participant. Comparison of prevalence of neck pain was done in Elite and Recreational Swimmers using statistical analysis. Data was further analysed using Chi-square test.

Results: The mean age of study population was 25.53 for Recreational swimmers and 19.75 years Elite swimmers. Out of the total 78 Recreational swimmers, 49 have never experienced Neck pain, 26 have experienced it sometimes and 3 swimmers have often experienced Neck pain. Out of the total 78 Elite swimmers, 34 have never experienced Neck pain, 37 have experienced it sometimes and 7 swimmers have often experienced Neck pain. There was statistically significant difference seen in prevalence of neck pain in Elite and Recreational swimmers. Elite swimmers have more Neck pain as compared to Recreational swimmers. Rest was the most preferred option for management of symptoms of Neck pain by majority of swimmers followed by physiotherapy and home remedies as the second and third preferred options by most swimmers.

Conclusion: This study concludes that Comparison of prevalence of neck pain in Elite and Recreational swimmers in Navi Mumbai. After comparing, significantly more prevalence was found in Elite swimmers but mild in Recreational swimmers.

Keyword: Elite swimmers, Recreational swimmers, neck pain, athlete.

INTRODUCTION

Swimming is one of the most popular recreational and competitive sporting activities [1]. Swimming requires highly repetitive upper extremity overhead movements to provide the majority of the propulsive forces for all four main strokes: free-style, butterfly, breaststroke and backstroke [2]. The Cervical vertebral movement is vital for effective, pain-free head turning in the Recovery phase with the freestyle stroke [3]. Neck extension is required in breaststroke and butterfly strokes. Backstroke swimming requires the prolonged contraction of the anterior neck to keep the face above waterline [4]

This leads to an increased risk of sustaining an injury, particularly musculoskeletal soft tissue injuries, among swimmers [1]. Muscle imbalance, weakness, and poor flexibility are some of the factors that may lead to athletic injuries of overstressed tissues. Another important factor of overuse injuries is poor technique. This is a common

cause of injury in swimming [5]. The World Championships identified most common anatomical locations for injuries next to shoulder, were the wrist/hand, followed by the lumbar spine, head/neck, hip and knee [11].

The neck is also subjected to sustained and repetitive movements, which can have implications for overuse injury[5]. Neck over-rotation loads cervical spine ligaments and muscles, which encourages asymmetrical development[5]. Neck pain (NP) is a common musculoskeletal problem with a lifetime prevalence of 14%–70% in the general population [6]. Neck Pain is defined as pain in the neck with or without pain referred into one or both upper limbs, that lasts for at least one day [7]. Although the prevalence of NP among athletes could be considered similar to that in the general population, their sports-specific injuries may put them at a higher risk of NP [6].

A competitive athlete is one who participates in an organized team or individual sport that requires systematic training and regular competition against others and that places a high premium on athletic excellence and achievement [8]. Characteristic of competitive athletes is the strong inclination to extend themselves to extremely high levels of exertion, often exceeding their native physical limits and sometimes for prolonged periods of time, regardless of other considerations [9]. Elite swimmers participate in International/National/Regional competitions [10]. For the purpose of this discussion, recreational sports activities are defined in juxtaposition to competitive sports[9]. Recreational swimmers participate in swimming for fitness activity and participate in local swimming competition [10].

Objectives:

- I. To find the prevalence of neck pain in Elite swimmers using self-made validated questionnaire.
- II. To find the prevalence of neck pain in Recreational swimmers using self-made validated questionnaire.
- III. To compare the prevalence of neck pain in elite and recreational swimmers.

MATERIAL AND METHODOLOGY

This cross-sectional study was conducted after taking approval from the ethical committee, participants were explained about the study and assured that their confidentiality will be maintained. participants were included by method of convenient sampling. Informed consent was obtained from the participants prior to data collection.

Inclusion Criteria:

Age:- 15 to 35 year

1. Elite Swimmers
 - participated international/national/state/regional competitions
 - Minimum 3 years of experience.
 - Training hours: Minimum 10hrs/week
3. Recreational Swimmers
 - swimming for health or fitness
 - Minimum 3 months of experience
 - Training hours: Minimum 2hrs/week
4. Neck pain felt dorsally between the occiput's inferior margin and T1
5. Both males and females are included in the study.

Exclusion Criteria:

1. Participants with any serious injury, tumour, infection or other non-mechanical cause of neck pain.
2. Any diagnosed cervical condition.
3. Participants experiencing pain which radiates from neck to arm.
4. Significant Cervical, shoulder, upper extremity disorder that required medical attention in past year.
5. Participants with any recent spinal fracture or cervical spine infection.
6. Participants with history of neurological disease.
7. Participants with any known psychological disorder.
8. Participants who have not given consent

PROCEDURE

After taking approval from the ethical committee, participants were explained about the study and assured that their confidentiality will be maintained. Informed consent was obtained from the participants. Demographic data was obtained including name, age, gender, occupation, address, contact details and screening was done. 'Self-made validated questionnaire for Swimmers' was provided to each participant. This is a self-applied questionnaire, and it evaluates the prevalence of neck pain in swimmers. Comparison of prevalence of neck pain was done in Elite and Recreational Swimmers using statistical analysis.

STATISTICAL ANALYSIS

MS Excel is used for data entry, graphical representation and statistics. Chi-square test analysis was done for comparison.

Total 156 swimmers participated in this study, out of which 78 were Elite swimmers and 78 were recreational swimmers, both are in the age group of 15-35 years.

RESULT

❖ **Distribution as per Age**

In the population sample of 156 participants, the mean age of Recreational swimmers was 25.53 age of Elite swimmers 19.75

Table 1.1 shows Mean and Standard Deviation (SD) of age of Recreational swimmers.

| AGE | Mean | Standard Deviation |
|-----------------------|-------|--------------------|
| Recreational swimmers | 25.53 | 6.371 |
| Elite swimmers | 19.75 | 13.45 |
| Total | 156 | |

❖ **Distribution as per Gender**

Table 1.2 shows comparative gender distribution in various swimmers.

| Gender | Frequency | Percent |
|--------|-----------|---------|
| Female | 23 | 29.5 |
| Male | 55 | 70.5 |
| Total | 78 | 100 |

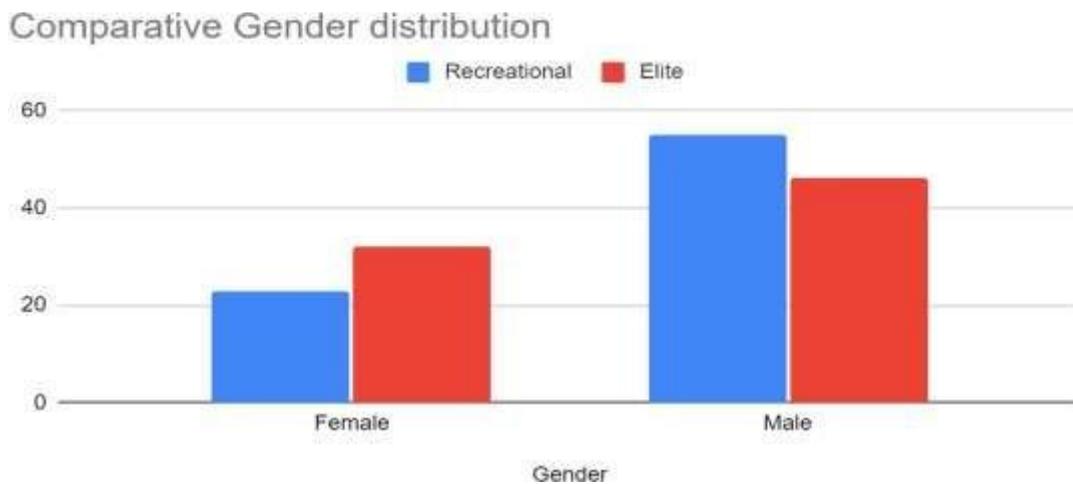


Table 1.3 shows the comparison of the incidence of Neck pain experienced by various swimmers.

| Incidences | Recreational | Elite | Chi-Square value | P value of Chi-Square test |
|------------|--------------|-------|------------------|----------------------------|
| Never | 49 | 34 | 6.23 | 0.04 |
| Sometimes | 26 | 37 | | |
| Often | 3 | 7 | | |
| Always | 0 | 0 | | |

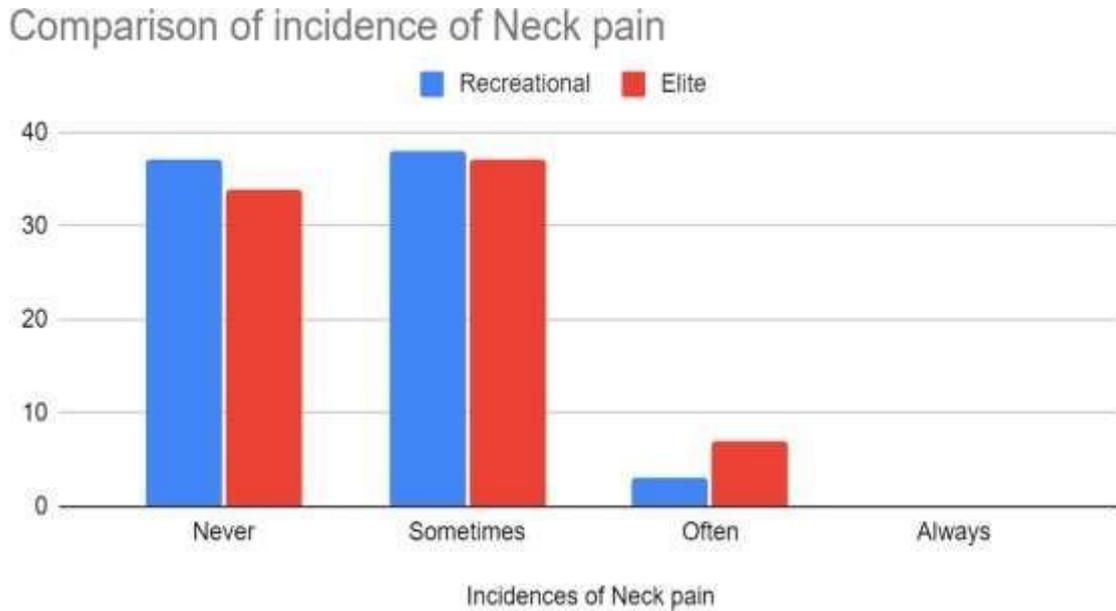


Fig:1.2
 There was statistically significant difference seen in prevalence of neck pain in Elite and Recreational swimmers. Elite swimmers have more Neck pain as compared to Recreational swimmers.

Table 1.4 shows the comparison of the severity of Neck pain experienced by various swimmer

| Severity of Neck Pain | Recreational | Elite | Total | Percentage |
|-----------------------|--------------|-------|-------|------------|
| Mild Pain | 16 | 37 | 53 | 33.97 |
| Moderate Pain | 11 | 5 | 16 | 10.26 |
| Severe Pain | 2 | 1 | 3 | 1.92 |
| No Pain | 49 | 35 | 84 | 53.85 |

Elite swimmers have mild neck pain as compared to Recreational swimmers who have moderate neck pain.

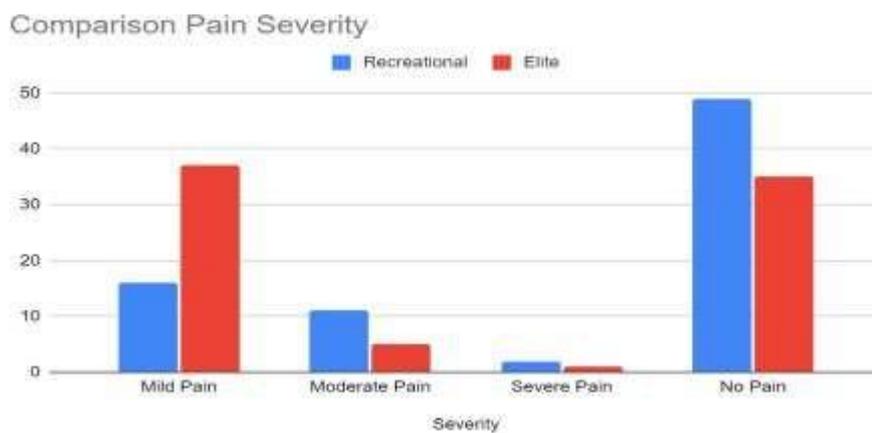


Fig 1.

Table 1.5 shows the comparison of associated symptoms of the Neck pain experienced in various swimmers

| Symptoms | Recreational | Elite | Total | Percentage |
|---------------------------|--------------|-------|-------|------------|
| Limited movements of neck | 5 | 11 | 16 | 10.26 |
| Stiffness of neck | 18 | 10 | 28 | 17.95 |
| None | 55 | 57 | 112 | 71.79 |

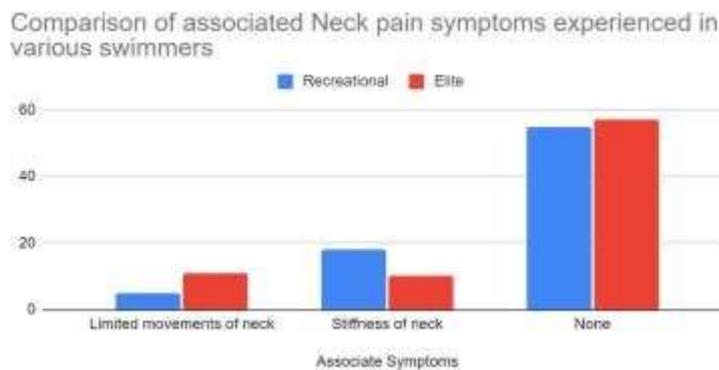


Fig .1.4

There was no difference seen in the prevalence of associated symptoms of Neck pain in Recreational and Elite swimmers.

Table 1.6 shows the comparison of preferred ways of managing the symptoms in various swimmers.

| Management | Recreational | Elite |
|-------------------|--------------|-------|
| Rest | 20 | 26 |
| Physiotherapy | 2 | 14 |
| Home remedies | 7 | 4 |
| Medical treatment | 0 | 0 |
| None | 37 | 34 |

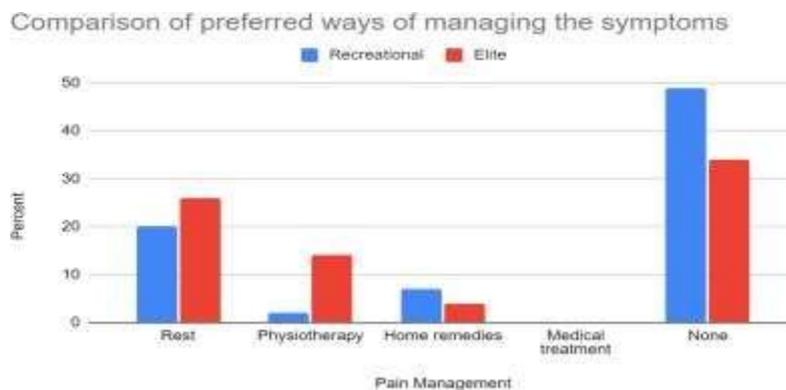


Fig 1.5

Rest was the most preferred option for management of symptoms of Neck pain by majority of swimmers followed by physiotherapy and home remedies as the second and third preferred options by most swimmer

DISCUSSION

Swimmers are subjected to the repetitive strain of many tissues of the spine and upper limb and as a result require positioning themselves in unusual anatomical positions to maximise force production. The aim of the study was to determine the Prevalence of Neck pain in Recreational and Elite swimmers. The study was conducted on 156 swimmers, out of which 78 were Recreational and Elite swimmers each were selected based on inclusion criteria.

The first objective of this research was to find out the prevalence of neck pain in various swimmers. The second objective was to compare the prevalence of Neck Pain in Recreational and Elite swimmers. The prevalence of Neck Pain in various swimmers was analysed using self-made validated questionnaire for swimmers. The results showed that there was prevalence of neck pain in Elite and Recreational Swimmers. Elite swimmers had more prevalence of neck pain as compared to Recreational swimmers. "Effect of Swim Training on the Physical Characteristics of Competitive Adolescent Swimmers" states that competitive swimmers often train 11 months /year and swim approx. 6000 to 7000 yards per practice during the training season. This frequent, high intensity practice leaves little time for rest and muscle recovery from repetitive microtrauma that occurs during the swim stroke [12].

In Elite swimmers, pain is usually caused by swimming specific demands prolonged training which causes muscle fatigue, muscle imbalance and muscle tightness . The excessive body roll during breathing and the attitude of maintaining the extension of the neck during the stroke related to neck pain [13]. In Recreational swimmers, swimmers are unable to handle their neck to breath properly, poor swimming technique, improper head and neck positioning during strokes, improper body alignment, incorrect equipment usage can lead to neck pain. Another article "Spinal Musculoskeletal Injuries Associated with Swimming: A Discussion of Technique" states that Swimmers deviate the head from the axis of rotation i.e. looking or breathing forward repetitively can cause unnecessary neck problems due to neck adopting an extended and rotated position. Neck over-rotation loads cervical spine ligaments and muscles, which encourages asymmetrical development. This is reason of neck pain in recreational swimmers.

In case, of site of pain in Elite as well Recreational swimmers experience pain in both the sides of neck and back side of neck, this is particularly due to various types of strokes. Majority swimmers have Freestyle stroke specialization followed by backstroke, breaststroke and butterfly stroke respectively. In these strokes neck over-rotation loads cervical spine ligaments and muscles, which encourages asymmetrical development. Poor body rotation results in over-rotation of the neck in order to breathe. Backstroke swimming requires the prolonged contraction of neck muscles to keep the face above the water line, which predispose cervical spine hyper flexion, these muscles are prone to fatigue and can result in muscles soreness. Elite swimmers experienced mild pain as they have dry land exercise training, which includes strengthening, endurance, speed, stretching training whereas Recreational swimmers experience moderate pain as they are don't have dry land exercise training before entering the water.

Therefore, the result shows that there is prevalence of neck pain in swimmers also Elite swimmers have more prevalence of neck pain as compared to Recreational swimmers.

CONCLUSION

This study concludes that Comparison of prevalence of neck pain in Elite and Recreational swimmers in Navi Mumbai. After comparing, significantly more prevalence was found in Elite swimmers but mild in Recreational swimmers.

LIMITATIONS OF THE STUDY

1. No other outcome measure was used to assess the prevalence of neck pain other than the self-made validated questionnaire for swimmers.
2. Age group was not evenly distributed.
3. The subjected nature of the study, i.e. Neck Pain, its severity and other associated symptoms were assessed by self-report only.

CLINICAL IMPLICATION

- Ergonomic advice can be given to swimmers regarding their head, neck, shoulder posture while swimming.
- Correct stroke method should be advised. Swimmers should be encouraged to roll their bodies from side to side when swimming freestyle and backstroke.
- Appropriate breathing techniques should be advised to avoid excess load on neck.
- Intervention strategies for reducing the pain faced by various swimmers.

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