



Musculoskeletal Problem Among Swimmers at Sayed Nazrul Islam National Swimming Complex in Mirpur, Dhaka

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ABSTRACT

Purpose: The study aimed to identify Musculoskeletal Problems among Swimmers at Sayed Nazrul Islam National Swimming Complex in Mirpur, Dhaka. **Objective:** The objective of this study was to find out socio-demographic information. **Methodology:** This study was performed in a cross-sectional study design. This study was conducted to determine the. This study's sample was collected through a convenience sampling procedure and a total sample of 52. The data was collected from Dhaka city. The data collection process was a questionnaire with a face-to-face interview. Data was analyzed with Microsoft Office and Excel 2019 using the SPSS 25 version software program and the study chi-square test. **Result:** This study's participants mean and standard deviation of participants' age where are mean \pm SD= 21.56 \pm 3.398; About (n=35) 67.30% were less than 22 years old, (n=13) 25% were 22-26 years old and (n=4) 7.70% greater than 26 years old. And the sex of the participants (n=44), 84.60% were male, and (n=8) 15.40% were female. This study found that 30.8% of participants felt pain in their bodies, and 69.2% felt no pain in their bodies. About 43.8% claimed their neck pain, 56.3% of respondents had shoulder pain, 6.3% had elbow pain, 18.8% had back pain, 37.5% suffered from hip pain, and the rest of the 37.5% had knee pain. Then, the researcher found that (n=36) 69.2% felt no pain, (n=15) 28.8% felt mild pain and (n=1) 1.9% were moderate pain. And about 57.70% had muscle cramps. **Conclusion:** This study focused on swimmers' musculoskeletal problems in Dhaka. There is an urgent need for the physician and medical care for swimmers

Key Words: Musculoskeletal Injuries; swimming; Shoulder, Hip, knee, low back pain.

INTRODUCTION

Swimming stands as a beloved sport transcending generations, appealing to occasional recreational enthusiasts, dedicated fitness swimmers, and those competing on national and international stages.¹ The inherent buoyancy of water provides a protective buffer, reducing the risk of injury for recreational swimmers. However, a growing body of literature highlights musculoskeletal challenges prevalent among competitive and elite swimmers, primarily stemming from repetitive strain and microtrauma.²

While participants seek the cardiovascular and respiratory benefits of swimming, prolonged exposure to the sport raises concerns about the musculoskeletal system's integrity. Despite the perceived high incidence of injuries in

swimming, the literature presents a scarcity of comprehensive epidemiological studies. Existing research often focuses on specific joints, particularly the shoulder complex, stroke specialties, or biomechanical aspects. Limited information is available on injuries among elite tournament participants.³

This study addresses this gap by describing injury patterns in competitive Greek male and female teenage swimmers over a decade. The research not only aims to provide insights into the epidemiology of musculoskeletal injuries but also endeavors to analyze injury patterns concerning gender and stroke specialty.⁴

Notably, shoulder pain emerges as a prevalent issue among competitive swimmers, significantly affecting their training and competition. Surveys in the United States report incidences ranging from 10 to 42%, with more than half of elite swimmers experiencing significant interfering shoulder pain. Repetitive arm movements during training are identified as a primary etiological factor contributing to shoulder pain in this cohort.⁵ Swimmers, covering considerable distances weekly, face increased demands on strength, endurance, and technique, particularly in the shoulder joint, leading to potential overload injuries over time.⁶

Considering the multifaceted nature of swimming performance, indicators such as stroke rate (SR), velocity, and stroke length play pivotal roles in elite pool and cold-water swimming assessments. Increased SR in freestyle swimming correlates with heightened metabolic heat production and increased velocity, while a decline in SR signals a swimmer's fatigue state, impacting overall performance.⁷

OBJECTIVE

General objectives

- To identify the musculoskeletal problem among swimmers at Sayed Nazrul Islam National Swimming Complex in Mirpur, Dhaka

Specific objective

- To identify the socio-demographic information of Swimmers
- To find out the most affected body region
- To explore the prevalence of musculoskeletal problems among swimmers
- To find out the association between Age, Sex, and Pain in any body parts

MATERIALS AND METHODS

Study design

The study used a cross-sectional design to identify musculoskeletal problems among swimmers at Sayed Nazrul Islam National Swimming Complex, Mirpur, Dhaka. This cost-effective and time-efficient approach allowed control for confounding variables during data analysis. The total sample comprised 52 swimmers, and data were collected at the mentioned swimming complex, focusing on the swimmer population, providing valuable insights into the prevalence of musculoskeletal issues in this specific group.

Inclusion Criteria

- Age Group: Participants must be above 18 years.
- Gender: Both male and female individuals are eligible.
- Willingness: Participants should express a voluntary willingness to participate in the study.

Exclusion Criteria

- Age: Individuals below 18 years are excluded from participation.
- Willingness: Those unwilling to participate voluntarily will be excluded from the study.

Data Collection

Data collected through face-to-face interviews at Sayed Nazrul Islam National Swimming Complex will undergo analysis using Microsoft Office Excel 2019 and SPSS version 25. The study utilizes consent papers, questionnaires, pens, pencils, files, calculators, stamp pads, computers, and printers. Employing a questionnaire method, where participants answer predefined questions, ensures a structured approach to gathering information. This meticulous data collection and analysis strategy aims to provide comprehensive insights into musculoskeletal problems among the surveyed swimmers.

Data analysis

Data analysis for this study employed the Statistical Package for Social Science (SPSS) version 25 software. Utilizing descriptive statistics, the findings were visually presented through pie charts, figures, and bar charts. This comprehensive analytical approach facilitated a clear and informative representation of the results, contributing to a nuanced understanding of musculoskeletal problems among swimmers at Sayed Nazrul Islam National Swimming Complex in Mirpur, Dhaka.

Ethical consideration

Ethical considerations include obtaining approval from the Ethical Review Board (SCMST) before commencing research and data collection. Participant confidentiality and privacy will be ensured, with informed consent obtained from all participants. Risks to participants will be minimized, and any potential benefits of the study will be communicated. The research will adhere to all relevant ethical guidelines and regulations, maintaining integrity and respect for the rights and welfare of participants throughout the study.

RESULTS

The study aimed to identify musculoskeletal problems among swimmers at Sayed Nazrul Islam National Swimming Complex in Mirpur, Dhaka. The researcher himself collected the data. Structured questions were used with both open-ended and close-ended questions in the questionnaire. The data were analyzed with Microsoft Office Excel 2019 with SPSS 25 version software program. In this study, the researcher used a bar, column, Figure, and Pie chart to show the study result because it is easier to make sense of a set of data.

Table 1: Association between Age, Sex, and Pain in any Body Part of the Participant

Variable	Do you have any pain in any part of your body?		Chi-value	P-value
	Yes (%)	No (%)		
Age Group				
<22	8 (22.9)	27 (77.1)	3.167	0.205
22-26	6 (46.2)	7 (53.8)		
>26	2 (50.0)	2 (50.0)		
Total	16 (30.8)	36 (69.2)		
Sex of the Participant				
Male	16 (36.4)	28 (63.6)	4.202	0.040
Female	0 (0.0)	8 (100.0)		
Total	16 (30.8)	36 (69.2)		

The table presents the association between age, sex, and pain in various body parts among participants. Participants below 22 years old had 30.8% reporting pain for age groups, while 46.2% and 50.0% in the 22-26 and >26 age groups, respectively. Males reported 36.4% pain, significantly more than females (0.0%). Chi-values and P-values indicate associations, emphasizing the need to further explore age and gender-related musculoskeletal issues among participants.

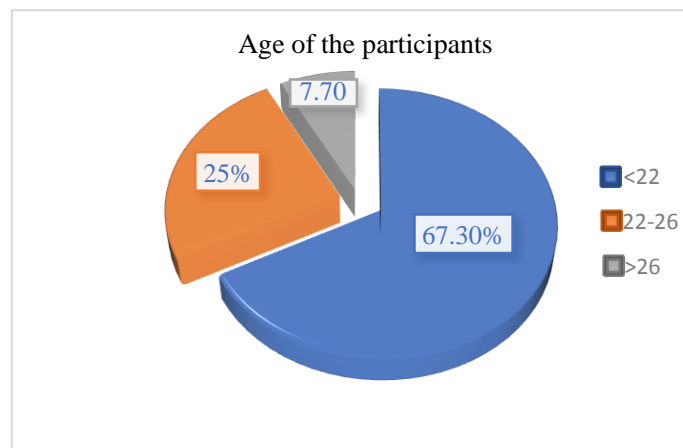


Figure 1: Distribution of participants according to age

This study's participants mean and standard deviation of participants age where are mean \pm SD= 21.56 \pm 3.398; About (n=35) 67.30% were less than 22 years old, (n=13) 25% were 22-26 years old and (n=4) 7.70% greater than 26 years old.

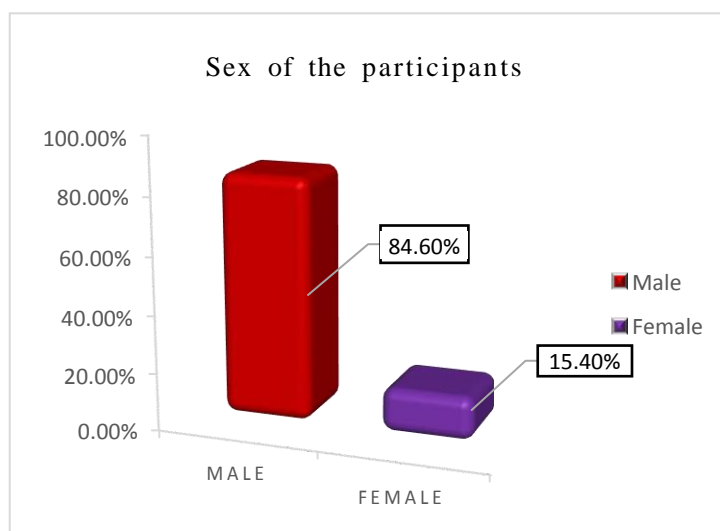


Figure 2: Sex of the participants

In this study, sex of the participants (n=44) 84.60% were male, and (n=8) 15.40% were female.

Table: Pain Distribution among Participants

Variable	Frequency	Percent
Do you have to feel pain in any part of your body?		
Yes	16	30.8%
No	36	69.2%
If the answer is "yes," responsible body parts are		
Neck	7	43.8%
Shoulder	9	56.3%
Elbow	1	6.3%
Back	3	18.8%
Hip	6	37.5%
Knee	6	37.5%

This study found that 30.8% of participants felt pain in their body, and 69.2% felt no pain in their body. About 43.8% claimed their neck pain, 56.3% of respondents were shoulder pain, 6.3% were elbow pain, 18.8% had back pain, 37.5% suffered from hip pain, and the rest of the 37.5% had knee pain.

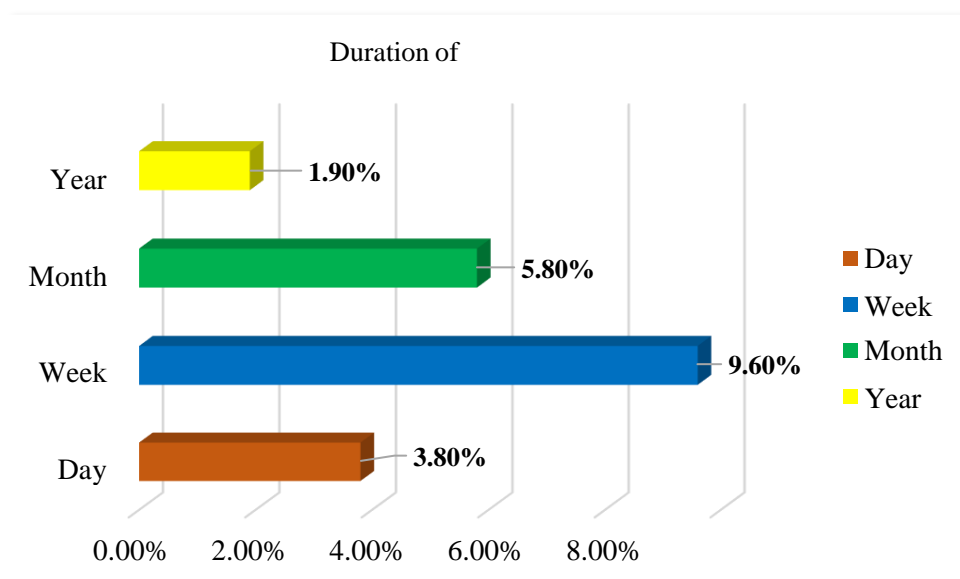


Figure 11: Duration of paresthesia of the participants

This survey shows that the duration of the paresthesia (n=2) 3.8% of the participants had paresthesia during the day, (n=5) 9.6% in a week and (n=3) 5.8% in the month, (n=1) 1.9% in the year.

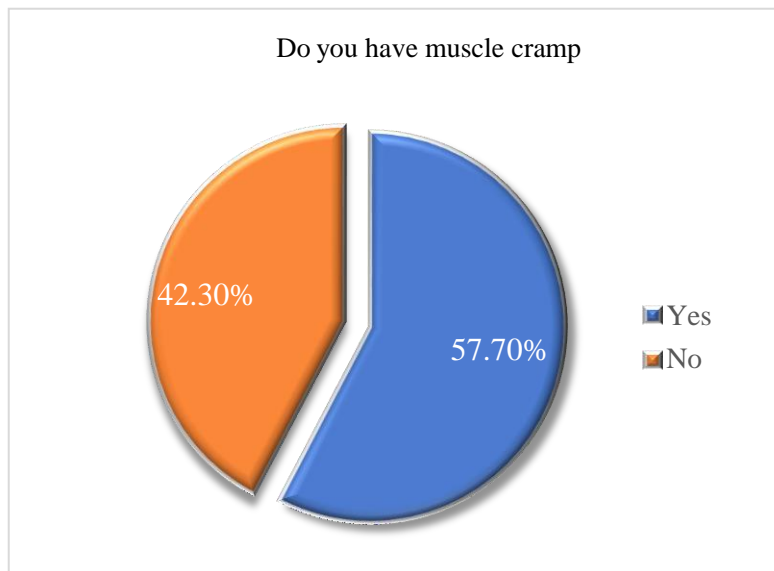


Figure 14: Muscle cramps of the participants

This survey shows that 57.70% had muscle cramps, and 42.30 didn't have a muscle cramp.

DISCUSSION

This study delves into the musculoskeletal problems prevalent among swimmers in the Dhaka division of Bangladesh, providing a comprehensive overview of the demographic characteristics, prevalence of musculoskeletal issues, and potential associations with age and gender. The findings contribute to understanding the challenges swimmers face in this region, offering insights that can inform targeted interventions and preventive measures.

The demographic characteristics of the study participants reveal a relatively young age group, with a mean age of 21.56 ± 3.398 . Most participants (67.30%) were below 22 years old, reflecting the youthful nature of competitive swimming. This aligns with the global trend where swimmers often start their training at a young age. In contrast, a study by⁸ involving 88 swimmers reported a broader age range, with a mean age of 47.1 ± 13.2 years. This discrepancy highlights the diversity in age demographics within the swimming community, encompassing younger and older individuals.

Gender distribution among the participants indicates a predominance of males, constituting 84.60%, while females account for 15.40%. This gender disparity is noteworthy and may reflect broader societal trends or specific preferences for sports participation in the local context. In comparison, an epidemiological survey of Greek swimmers by⁹ found a more balanced gender distribution, with 51% male and 49% female subjects. The observed gender differences may influence the prevalence and nature of musculoskeletal issues, considering potential variations in training intensity, techniques, and body mechanics between male and female swimmers.

The prevalence of musculoskeletal problems among the study participants is a crucial finding. The study identified that 30.8% of participants reported experiencing pain, with specific concerns raised about neck pain (43.8%), shoulder pain (56.3%), elbow pain (6.3%), back pain (18.8%), hip pain (37.5%), and knee pain (37.5%). These findings align with existing literature highlighting the vulnerability of swimmers to musculoskeletal issues, particularly in the upper extremities.^{10,11} The prevalence of shoulder pain, in particular, is consistent with multiple studies, emphasizing the repetitive arm movements during swimming as a significant contributing factor.¹²

The temporal distribution of musculoskeletal complaints, with a higher incidence during training sessions than competitions, underscores the importance of targeted preventive measures during practice. The repetitive nature of swimming strokes and the intensity of training contribute significantly to the development of musculoskeletal problems. This finding aligns with previous research indicating that training dynamics play a crucial role in the manifestation of such issues among swimmers.¹³

Comparisons with international studies highlight the global nature of musculoskeletal issues in swimmers. The prevalence of shoulder problems (62.5% to 62.3%) and other pain locations, such as knee and lower back, reinforces swimmers' recurrent challenges across different regions.¹⁴ The consistency in reported pain locations suggests common risk factors or biomechanical aspects influencing musculoskeletal health in swimmers globally.

This study set specific objectives to explore potential associations between age, gender, and musculoskeletal pain.

However, the chi-square test did not yield significant solid associations.¹⁵ The lack of significant findings suggests that a complex interplay of factors beyond age and gender influences musculoskeletal problems among swimmers. Further research with larger sample sizes and additional variables may provide a more nuanced understanding of these associations.

The comprehensive exploration of musculoskeletal problems among swimmers in the Dhaka division offers valuable insights for researchers and practitioners. The findings underscore the need for targeted interventions during training sessions to address the high prevalence of musculoskeletal problems. Additionally, the comparison with international studies enhances the generalizability of the findings, emphasizing the global relevance of these challenges within the swimming community.

This study significantly contributes to understanding musculoskeletal issues among swimmers in the Dhaka division. The findings provide a foundation for future research, emphasizing the importance of considering age, gender, and training dynamics in developing effective preventive measures. The global resonance of these issues underscores the need for a holistic approach to promote swimmers' musculoskeletal health and well-being worldwide.

CONCLUSION

The study identified musculoskeletal issues among swimmers in Mirpur, Dhaka. Urgent medical attention is warranted to address these problems. The findings highlight the importance of providing adequate healthcare services for swimmers to ensure their well-being and continued participation in the sport.

Recommendation

1. **Expand Research:** Investigate musculoskeletal issues among swimmers with a larger, diverse sample for comprehensive insights.
2. **Prioritize Physiotherapy:** Develop research-based physiotherapy practices, focusing on prevalent problems like low back, neck, shoulder, pelvic, and hip pain.
3. **Diversify Studies:** Explore broader physiotherapy areas, including common musculoskeletal problems and interventions for swimmers' health issues to enhance service effectiveness.

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Abbreviations

SCMST: Saic College of Medical Science and Technology

PT: Physiotherapy

LBP: Low back

pain MS:

Musculoskeletal

MSP: Musculoskeletal pain

NPRS: Numerical pain rating scale

NSAIDs: Nonsteroidal Anti-Inflammatory Drugs

Summary

The study aimed to uncover musculoskeletal problems among swimmers in Dhaka, Bangladesh. It found a high prevalence of pain, notably in the neck, shoulders, and hips, with the majority reporting discomfort. Limited associations were found between age, sex, and pain occurrence. These findings contribute significantly to the existing literature by providing insights into specific pain areas and their prevalence among Dhaka swimmers, highlighting the need for targeted interventions and further research.

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