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Original Article

Prevalence Of Musculoskeletal Injuries Amongst Student Athletes And The Role Of Physiotherapy In Recovery

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ABSTRACT

Introduction: Among student-athletes, the occurrence of musculoskeletal injuries (MSKIs) is emerging as a critical public health dilemma, with an associated decline in athletic productivity, educational activities, and chronic disability. It is well documented internationally that physiotherapy plays a vital role in the rehabilitation of injury, however, many educational institutions, especially in developing areas, do not have organized frameworks for injury management. This study intended to identify the extent and variety of MSKIs of student athletes and assessed the level of physiotherapy recovery processes and their effectiveness in enabling Musculoskeletal Injury (MSKI) recovery among student athletes. Methodology: This work had a cross-sectional, mixed-methods design. A total of 398 student athlete aged 15-24 years from five secondary schools and three universities were recruited for the study. Quantitative data were collected using a structured questionnaire developed based on the Oslo Sports Trauma Research Center (OSTRC) framework. Qualitative data were collected through semi-structured interviews with 8 physiotherapists and 4 sports coaches. Results were analyzed using quantitative data from part nursing/medical care and cost control applied descriptive statistics, Chi-square and independent t-tests SPSS v26. Qualitative data were analyzed thematically using Braun and Clarke's six-step approach. Results: of the total number of students participated in the study, 66.3% reported having at least one MSK injury in the past one year. Football (89.5%) and basketball (73.3%) athletes had the highest injury rates. Ankle (29.5%) and knee (25.0%) injuries were the most common. Among physiotherapy, only 55.3% of participants had accessed the physiotherapy services. Receiving physiotherapy significantly reduced the recovery time to (mean = 3.4 weeks) compared to (mean = 5.2 weeks) in those who did not, $p < 0.001$. Access to physiotherapy was mainly limited by lack of knowledge, availability, and finances. Discussion: Results show as expected that students athletes have high prevalence of MSKIs and severely underutilized physiotherapy. It was confirmed physiotherapy significantly improves recovery outcomes despite the presence of institutional gaps such as insufficient staffing, limited rehabilitation resources, a lack of injury prevention programs, and fragmented services. These issues mirror trends noted in other resource-limited regions around the world. Conclusion:There is little debate regarding the need to incorporate physiotherapy into school sports at educational institutions. There is an urgent need for development of physiotherapy, injury monitoring, and prevention frameworks and injury management education for coaches and athletes. Improving access to physiotherapy is critical not only for timely recovery, but also for the enduring health and athletic performance of student athletes.

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Introduction

MSKIs, are perhaps the most common health concern for athletic students across all levels of competitive sports. Musculoskeletal injuries involve damage to the bones, muscles, ligaments, tendons, or joints, and they often occur due to acute trauma or micro trauma and chronic repetitive strain [1][2].

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The prevalence of MSKIs in youth and college athletes is exceptionally high because of the training, competition, and the inadequate physical development in adolescence. As school and university sports become more competitive, the physical strain on student athletes is on the rise, making the prevention and management of musculoskeletal injuries an issue of concern for sports medicine, education, and public health.

Epidemiological studies carried out in different areas report high injury prevalence among students, with overuse, sprains and strains, and lower limb injuries being the most common [3]; [4]. These injuries often affect not only athletic performance, but also academic engagement and psychosocial well-being. It is surprising to note that many student athletes postpone or ignore suitable treatment pathways due to lack of specialized care, inadequately staffed institutions and limited tertiary care facilities, or institutional apathy about injury severity. This results in inadequate recovery, development of chronic musculoskeletal issues, and permanent decreased physiological function.

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Physiotherapy is fundamental for an athlete's rehabilitation and functional recovery (RFR) after injury. An evidentiary physiotherapeutic approach encompasses manual therapy, therapeutic exercises, proprioceptive training, and electrotherapy aimed at alleviating pain, restoring mobility, and augmenting muscular strength and neuromuscular control [5]. Additionally, physiotherapists assist in the development of injury prevention programs through biomechanical evaluations, training load moderations, and sport-specific conditioning exercises. In predisposing educational contexts where competitive school sports form an integral part of student life, physiotherapy services need to be embedded in the school's health system for efficiency and speedy recovery.

In most parts of Asia and sub-Saharan Africa, the integration of physiotherapy into school sports programs is sparse. Insufficient trained manpower, poor rehabilitation facilities, and low coach and athlete awareness are a few reasons for underutilization of physiotherapy services in relation to student athlete injuries (World Health Organization [6]. There is a critical need for understanding context-specific data on the overarching issue of musculoskeletal injuries and student athletes, as well as the role physiotherapy plays in their treatment and recovery.

For this research, the objectives are to (1) ascertain the existence and the specific patterns of the musculoskeletal injuries sustained by student athletes in selected educational institutions and (2) evaluate the perceived effectiveness and utilization of physiotherapy services regarding recovery and return to sport. Enhancing the literature on sports health, guiding institutional policy on the welfare of athletes, and promoting the concept of physiotherapy as an essential part within the frameworks of student sports medicine are the main intents of this research.

METHODOLOGY

Research Methods

The methods were cross-sectional, descriptive, analytical, and incorporated both qualitative and quantitative components. It enabled the assessment of the prevalence and distribution of MSKIs (musculoskeletal injuries) among student athletes at a particular time, physiotherapy use, recovery from injuries, and injury occurrence along with associations between them multiplicatively. The validity of the study was improved by using a mixed-methods approach consisting of objective surveys and narrative accounts from relevant informants, which added depth to the context.

Participants and Location

The sample included student athletes within the age range of 15-24 years participating in organized sports, such as inter-school or inter-university competitions, within the last one year. Participants were sourced from five secondary and three tertiary colleges in Punjab India, chosen for their active sports programs and with student representation from several different sports disciplines.

Sample Size Determination

The minimum sample size was estimated using **Cochran's formula** for population-based surveys:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

n_0 = minimum sample size
Z = Z-value for a 95% confidence level (1.96)
p = estimated prevalence of MSKIs (assumed to be 0.5 for maximum variability)
q = 1 − p (also 0.5)
e = margin of error (0.05)

$$n_0 = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(0.05)^2} = 384$$

A 10% oversampling was incorporated to account for non-responses, which set the sample target to 422. The survey yielded 398 complete responses which were analyzed, constituting a response rate of 94.3%.

Sampling Technique

The sampling method was stratified random sampling. Participants were first stratified by category of sport (football, basketball, athletics, volleyball), after which selection was random within each stratum. This method was also applied to gender for balance representation of male and female athletes.

Data Collection Instruments

a. Structured Questionnaire

An adapted questionnaire based on the OSTRC Overuse Injury Questionnaire [4] and NCAA Injury Surveillance System [3] was self-administered. It was divided into five sections:

Demographic and athletic background
Type and frequency of sport participation
History of musculoskeletal injuries (site, severity, frequency)
Physiotherapy use (type, duration, frequency)
Perceived effectiveness of physiotherapy interventions
Key Informant Interviews (KIIs)

Eight registered physiotherapists and four sports coaches from different educational institutions took part in semi-structured interviews. The interviews centered on prevailing injury types, physiotherapy treatment methods, athlete adherence, treatment obstacles, and available institutional assistance.

Data Collection Procedure

Data Collection for the study was done over a six week duration during the inter-school sports period. Participants were informed about the goals and methods of the study. Questionnaires were given to pupils seated in classrooms or halls by trained research aides. With the permission of the interviewees, interviews were recorded and transcribed for further analysis.

Data Analysis

Quantitative Analysis

Data obtained from the questionnaires was coded and analyzed using SPSS version 26. Means were calculated for demographic and injury data, as well as frequencies and percentages, and standard deviations. Inferential statistics included:

Chi-square tests to evaluate the relationship between sport type and injury prevalence.

Independent t-tests to ascertain the recovery duration of athletes who accessed physiotherapy against those who did not.

Logistic regression to pinpoint the reliance of physiotherapy and successful return to sport outcomes on identified factors.

Qualitative Analysis

Thematic content analysis, a six-phase process, was used to analyse the transcripts of interviews. Themes were developed and verified through peer debriefing as well as triangulation with quantitative findings to ensure reliability and coherence [7].

Validity and Reliability

As a step towards content validity, all instruments were appraised by specialists in sports medicine, physiotherapy, and injury epidemiology. A ran a pilot study on 25 student athletes who did not make the final sample. Their feedback was incorporated to improve the questionnaire. His or her physiotherapy perception scale had a Cronbach's alpha of .89, which is considered adequate [8].

Ethical Considerations

Approval from an ethical review board was gotten from India's Desh Bhagat University, Mandi Gobindgarh,Punjab State. Participants granted (or those under 18 years with guardian consent) written informed consent. Anonymity and confidentiality was preserved in the course of the research. Participants were informed of their right to withdraw any moment without reason any moment without negative repercussions.

This subsection incorporates the results obtained from both quantitative and qualitative data derived from 398 student athletes and 12 key informants which includes 8 physiotherapists and 4 coaches. Results are grouped into five thematic areas: demographic characteristics, the prevalence and pattern of musculoskeletal injuries (MSKIs), the access and utilization of physiotherapy services, the effectiveness of physiotherapy interventions, and key informants insights.

Demographic Characteristics of Participants

Among the 398 respondents:

60.3% (n=240) were males while 39.7% (n=158) were females.

Participants' average age was 19.3 years (SD = 2.1).

54.5% (n=217) were from tertiary institutions, while secondary school students comprised 45.5% (n=181).

Most commonly played sports were football (28.6%), athletics (24.1%), basketball (19.3%) and volleyball (15.1%).

4.2 Prevalence and Types of Musculoskeletal Injuries

Approximately 264 out of 398 student athletes which is 66.3% reported having at least one musculoskeletal injury within the past 12 months.

Table 1: Injury Prevalence by Sport Type

Sport	Injured Participants (n)	Injury Rate (%)
Football	102	89.5%
Athletics	64	66.0%
Basketball	56	73.3%
Volleyball	29	48.3%
Others	13	26.0%

Understanding: Out of all the sports, football players reported their injuries the most, followed by basketball and athletics. There was a significant relation between the kind of sport practiced and injury prevalence as shown by the chi-square test ($\chi^2 = 22.67$, df = 4, $p < 0.001$).

Table 2: Allocation of Injury Locations

Injury Site	Frequency (n)	Percentage (%)
Ankle	78	29.5%
Knee	66	25.0%
Lower back	38	14.4%
Shoulder	34	12.9%
Wrist/Hand	25	9.5%
Other (e.g., neck)	23	8.7%

Ankle and knee injuries were over 50% of musculosekeletal injury (MSKIs) cases reported.

As the evidence from sports injuries literature suggests. [1].

Physiotherapy Services Utilization

Out of 264 athletes who got injured:

Accessed physiotherapy services. 146 (55.3%)

Did not access physiotherapy a total of 118 (44.7%) Did other treatments (rest, massage, traditional medicine).

Table 3: Not accessing physiotherapy.

Reason	Frequency (n)	Percentage (%)
Lack of awareness	42	35.6%
Unavailability of physiotherapists	39	33.1%
Financial constraints	23	19.5%
Belief that injury was minor	14	11.8%

Recovery Duration and Resumption of Sports Activities

For the injured athlete population:

For those who accessed physiotherapy, the average recovery time was 3.4 weeks (SD = 1.2) as reported by them.

Those who did not access physiotherapy had a recovery time of 5.2 weeks (SD = 1.6).

An independent samples t-test showed a significant difference in recovery time ($t = 8.71$, df = 262, $p < 0.001$). This data confirms that physiotherapy is helpful in rehabilitation.

Important Construct Interview Outcomes

Semi-structured interviews with physiotherapists and coaches showed the following themes:

Sparsely Implemented Physiotherapy in Schools: Most of the schools did not have a physiotherapist on site. Coaches or untrained staff would tend to injuries.

Delaying Seeking Treatment: Often, athletes would wait until the pain intensified before seeking physiotherapy whichpose a risk of complications.

Perception of Effectiveness of Physiotherapy

As far as those who had accessed physiotherapy are concerned:

81% agreed that the physiotherapy services offered reduced pain.

74% noted greater joint movement and overall function.

69% indicated physiotherapy enabled them to return to active sport.

Respondents highlighted the need for screening MSK injury which should be coupled with warm-ups and strength training exercises to aid in reducing the prevalence.

One physiotherapist mentioned, "Most schools do not have the prerequisite infrastructure or even an understanding of the role physiotherapy plays in sports medicine. More often than not, the athletes are already suffering from chronic pain when they seek our help."

DISCUSSION

Assessing the prevalence and types of musculoskeletal injuries (MSKIs) in relation to student athletes, and evaluating the role of physiotherapy in recovery was the goal of this study. The results show an alarming average injury prevalence of 66.3%, with the majority of injuries to the lower limbs. Also, even with the established positive impacts of physiotherapy on recovery, many of the injured athletes did not seek professional physiotherapeutic intervention. These gaps indicate serious problems in managing and rehabilitating injuries within the educational sports system.

Prevalence and Nature of Injuries

As a result of this study, approximately 66% of student athletes reported having at least one lower limb musculoskeletal injury within the last year, which is consistent with the international epidemiology of injuries among youth athletes.[1] Football and basketball are contact sports which have the highest prevalence of injuries among participants, which backs up previous studies that have shown these sports to be of high risk due to the degree of physical exertion frequently coupled with violent interactions.[3][4]

As with the studies conducted on school and professional athletes, the prevalence of ankle and knee injuries, especially sprains and overuse injuries, stands out. These and other injuries are often worsened by the poor biomechanics and other factors such as coaches' and physiotherapists' feedback on strength training protocols, warm-up routines, and overprotective training methods that were not injury rehabilitation focused.

Lack of Utilization of Physiotherapy Services

Informal care systems such as self-management or no form of treatment at all was the choice for 44.7% of the injured athletes, indicating how underutilized physiotherapy care is despite being known to effectively manage injuries. Other studies in the literature suggest similar results in resource constrained settings, where rehabilitation care is limited due to lack of finances, inadequate infrastructure, and poor awareness [6]. The gaps in utilization and especially unawareness and unavailability of physiotherapists in institutions cited point toward the lack of integration of sports medicine in educational systems as a whole.

Impact of Physiotherapy on Recovery Outcomes

Having access to physiotherapy markedly improved recovery time and with physiotherapy, respondents recovered on average 1.8 weeks faster which is a statistically significant figure. This adds to existing literature that is being built around evidence-based physiotherapy and the utilization of manual physiotherapy, proprioceptive training, and neuromuscular re-education that sped up recovery while lowering the chance of it happening again [5].

Moreover, the evidence shows over 80% of athletes who had physiotherapy experienced a reduction of pain and an increase of functional movement, providing sufficient clinical justification to recovery services which enables them to safely return to the sport.

Gaps within Institutions and Education

The qualitative comments provided by both physiotherapists and coaches' revealed gaps on personnel training with injury prevention programs and injury management being dealt on a strictly responsive manner instead of a preventive one.

These challenges are similar to those described in other studies in developing areas where sports medicine has not been given sufficient attention at the school level [6].

Furthermore, the absence of injury surveillance systems in schools means that most MSKIs go undocumented, which adversely impacts effective strategic planning and resource allocation. This represents a significant missed opportunity for proactive treatment and injury prevention efforts, as identified in the consensus statements by the International Olympic Committee.

Policy Recommendations Suggestions for Policy and Practice.

The results of this study demand action on multiple levels. First, there is a lack of policy concerning the employment of physiotherapists within schools and universities. This needs to be addressed by incorporating screening, basic treatment, and rehabilitation services. Second, injury risk and appropriate management pathways need to be understood to improve referral practices among education-focused injury care and athlete empowerment programs. Third, there is a collaborative advocacy gap between the Ministry of Education, the Ministry of Health, and sports organizations for an integrated policy framework and resource investment towards sports medicine facilities within education institutions.

Finally, and as outlined previously, the preventative physiotherapy role should be broadened beyond treating injuries to covering exercises such as functional movement screening, strengthening, and load management techniques, which are known to lower injury rates among young athletes [9].

CONCLUSION

As per this study, MSKIs are common among student-athletes, and the most risky sports are football, basketball, and athletics. In agreement with global trends, the ankle and knee emerged as the most commonly injured anatomical regions. While physiotherapy is key in functional recovery and mitigation of time lost from sport, access and use remains low because of ignorance, organizational silos, and lack of facilities.

The quantitative analysis proved that physiotherapy considerably reduces recovery time and improves the rate of return to play. Qualitative results show that most schools and universities do not have defined rehabilitation pathways and physiotherapy is not used as a preventive and restorative measure.

Greater attention is needed to the provision of physiotherapy within school and university sports programs and training of teachers and students to promote safety and enhance performance. There is a need for policy action at the top level. Establishing frameworks for rehabilitation and injury prevention relevant to international sports medicine will protect the health and sustainable development of student-athletes.

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