



Research Article

IJSEHR 2026; 10(1): 12-17
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www.sportscienceresearch.com
Received: 27-05-2025
Accepted: 23-07-2026
Published: 24-08-2026
DOI: 10.31254/sportmed.10103

Awareness of Overuse Injuries Among Athletes in Non-Contact Sports: A Cross-Sectional Study

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Abstract

Introduction: Sports are classified into contact and non-contact types. Traumatic injuries are more common in contact sports, while overuse injuries result from repetitive micro-trauma in non-contact sports. Awareness of overuse injuries is crucial for timely intervention. This study aims to assess overuse injury awareness among non-contact sport athletes in India. **Methods:** A cross-sectional descriptive survey was conducted among 1050 non-contact sports athletes from major training centers in Lucknow. The questionnaire included demographic/sport-related questions and seven assessing overuse injury awareness. After receiving 918 responses and excluding 12, 906 were analysed. Statistical analyses were done using IBM SPSS Statistics 26.0 with significance set at $p < 0.05$. **Results:** The study involved 906 athletes from badminton (34.2%), athletics (29%), cricket (18.4%), and swimming (18.4%), mostly male (64%). The largest educational group held undergraduate degrees (30.5%). Most competed at district level (25.3%) with one to three years of experience (47.2%) and trained six to fifteen hours weekly (48.3%). Nearly half (47.2%) had never heard of "overuse injury." Swelling was the most recognized sign (23.8%), and the elbow (26.4%) was seen as most vulnerable, followed by the shoulder (21.2%). Back stretches (21.2%) and jumping/landing drills (21.1%) were believed to cause overuse injuries. When suspecting an injury, 26.2% didn't know how to respond. Regarding training hours and injury risk, 31.8% agreed, 39% disagreed, and 29.2% were unsure. Notably, 50.1% wrongly believed weight training doesn't increase overuse injury risk. **Conclusion:** The results reveal a concerning lack of awareness: fewer than one in four competitive athletes understood overuse injuries, and nearly half had never heard of them. This study supports creating targeted sports health education programs in India and similar contexts. Coaches, physiotherapists, and sports scientists are ideal educators due to their trusted roles. Future research should conduct longitudinal studies on educational interventions' impact on awareness and injury reduction among non-contact sport athletes.

Keywords: Overuse Injuries; Injury Awareness; Athletes; Non-Contact Sports; Sports Injury Prevention; Sports Health Education.

INTRODUCTION

Sports can broadly be classified into two types – contact sports, where there is a possibility of players from opposing teams to come into physical contact with each other during play; common examples include Basketball, Football, Boxing etc. and non-contact sports, where contestants do not have any possible means of making physical contact with the opposing player in any way. Examples of popular non-contact sports are: Tennis, Table tennis, Badminton, Cricket etc [1,2].

Injuries in sports can occur due to a traumatic event during play or practice. Traumatic injuries are more common in contact sports and can be due to fall, collision with opposing player, hit by ball or racquet or as a part of the game in combat sports. The other type of injury is more subtle and remains hidden for a long time before being detected by the player or their coaches. This type of injury is known as overuse injury and is a sequela of repetitive micro-trauma commonly occurring during non-contact sports [3-5]. The identification of overuse injuries in sports constitutes a significant challenge due to their non-specific and misleading symptomatology [6,7]. Overuse injuries are also known by synonyms such as covert injuries, silent injuries, hidden injuries etc [4,8-10].

Awareness of overuse injuries is essential for timely intervention and effective management. Athletes who are well-informed are more likely to adopt appropriate training practices, seek early medical attention and implement preventive measures such as adequate rest, proper warm-up and strength conditioning [11]. Despite the high prevalence and impact of overuse injuries, there is limited research focusing specifically on the level of awareness among athletes participating in non-contact sports. Hence, the present study

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was undertaken to address this gap in the literature and to provide further implications for practice and future research. Therefore, the present study aims to assess the awareness of overuse injuries among athletes involved in non-contact sports in India.

MATERIALS AND METHODS

Study Design

Cross-sectional descriptive survey.

Participants

Inclusion Criteria

- Players participating in non-contact sports
- Participants had to be athletes above 11 years of age
- Players who were undergoing professional training for a minimum period of six months
- Taking training in different sports college of Lucknow

Exclusion Criteria

- Players participating in contact/collision sports
- Athletes less than 11 years of age
- Players who are injured in the last 6 months
- Recreational/Amateur athlete not taking training under any professional coach

Study Population and Setting

Questionnaires were distributed among 1050 non-contact sports athletes belonging to prominent multi-disciplinary sports training centers of Lucknow. The research procedures were conducted, and the participants were contacted by using social media channels such as WhatsApp, telephonic calls, team coaches, players and administrators for online filling of questionnaires using a Google form link. An approval from all participants through a consent form was obtained before conducting this study and distributing the survey questionnaire.

For data collection, the study used a self-structured questionnaire related to awareness of overuse injuries in non-contact sports for data collection purpose. The study questionnaire variables were validated by an expert in the field of sports injury, an international coach, a former international player and institutional medical professor to ensure it adequately measured the concepts involved in this study.

A total of 1050 questionnaires were distributed among athletes. Weekly reminders through WhatsApp were provided to the players to encourage completion of the questionnaire. A final reminder was issued three months after the initial distribution. Players who did not complete the questionnaire after the final reminder were considered as non-responders.

Following the final reminder, 918 questionnaire responses were received, with a response rate of 87%. On reviewing the responses, 12 responses were excluded as they were incomplete, contained missing information, included inappropriate or double-marked answers, or came from players aged under 11 years, recreational players, players participating in contact or collision sports, or players injured in the last 6 months. Consequently, a total of 906 players were included in the final analysis. Ethical approval for this study was sought from the Institutional Ethics Committee (IEC code: 2022-180-EMP-129).

Measurement of Variables

This study uses a structured questionnaire, comprising two parts. The first part comprised athletes' identity, demographic characteristics (age and sex), sports, education and competition related questions. The

second part comprised seven questions specifically focussed on "Awareness of overuse injuries in non-contact sports", to assess knowledge, recognition behaviour and training-related risk perceptions among athletes across varied non-contact sports and competitive levels (Table 1).

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics, version 26.0, with a significance threshold set at $p < 0.05$. Descriptive statistics were used to summarise demographic characteristics and survey responses, with categorical variables reported as frequencies and percentages. To evaluate the distribution of awareness responses across response categories, a Chi-Square Goodness-of-Fit test was employed, with the null hypothesis assuming equal distribution across all categories. To examine associations between awareness of overuse injuries and demographic or training-related variables (including age group, sex, sport type, education level, competition level, years of competitive experience, and weekly training hours), Chi-Square Tests of Independence were conducted. For variables involving ordered or non-normally distributed categories, Kruskal-Wallis H tests were additionally applied to confirm the robustness of findings. All tests were two-tailed and results with $p < 0.05$ were considered statistically significant.

RESULTS

Participant Demographics

The study comprised 906 competitive athletes drawn from four sports: Badminton (34.2%), athletics (29.0%), cricket (18.4%) and swimming (18.4%). The overwhelming majority of participants were male (64%), while females constituted 36% of the sample. Educationally, the largest group held undergraduate qualifications (30.5%), followed by postgraduate or higher (25.9%), high school or below (24.5%) and intermediate level (19.1%). In terms of competitive experience, most athletes competed at district level (25.3%) or had no competitive experience at all (21.4%), with state, international and national level athletes making up the remainder. The largest bracket for years of experience was one to three years (47.2%), followed by more than three years (29.2%) and less than one year (23.6%). Regarding weekly training, approximately half trained between six and fifteen hours (48.3%), over a third trained more than fifteen hours (35.4%) and the remainder trained fewer than six hours per week (Table 2).

Overall Level of Awareness

When athletes were asked whether they had previously encountered the term "overuse injury", the results revealed a pronounced awareness gap. Nearly half of all participants (47.2%), had never heard the term before, while only 23.1% confirmed genuine prior awareness and 29.7% were uncertain. In practical terms, this means that roughly only one in four competitive athletes was truly aware of overuse injuries, a clinically significant deficit given the population's routine exposure to associated risk factors (Table 3).

A Chi-Square Goodness-of-Fit test was applied to determine whether the three response categories were equally distributed. The test returned a chi-square value of 84.815 with two degrees of freedom and a p-value below 0.001, confirming that the distribution of responses was far from equal and that the "No" category was disproportionately dominant. This statistically confirms that unawareness is systematically prevalent rather than randomly distributed.

Chi-square tests of independence were then performed to examine whether awareness differed across demographic subgroups. All tested variables except age group ($\chi^2 = 0.452$, $df = 2$, $p = 0.798$) and gender ($\chi^2 = 0.927$, $df = 2$, $p = 0.629$) returned highly significant results: sport type

($\chi^2 = 154.421$, $df = 6$, $p < 0.001$), competition level ($\chi^2 = 121.913$, $df = 8$, $p < 0.001$), years of experience ($\chi^2 = 1337.616$, $df = 4$, $p < 0.001$), training hours per week ($\chi^2 = 144.263$, $df = 4$, $p < 0.001$), and education level ($\chi^2 = 88.219$, $df = 6$, $p < 0.001$). Additionally, Kruskal-Wallis tests confirmed significant associations between awareness and competition level ($H = 74.284$, $p < 0.001$) and between awareness and weekly training hours ($H = 89.945$, $p < 0.001$). These findings indicate that awareness of overuse injuries is not uniformly distributed across the athlete population but varies meaningfully with experience, training volume and demographic profile.

Signs, Symptoms and Anatomical Regions

Participants were asked to identify signs pointing toward overuse injuries, with multiple selections permitted. The most commonly recognised sign was swelling, selected by 23.8% of participants, followed jointly by stiffness after rest or sleep and gradual decrease in performance, each chosen by 21.1%. Pain was identified by 18.4%, unexplained fatigue by 15.9%, tenderness on pressing a specific spot by 13.0% and reduced range of motion by 10.6%. Notably, 10.4% of participants indicated they did not know any signs. A Chi-Square Goodness-of-Fit test yielded $\chi^2 = 99.148$ with seven degrees of freedom and $p < 0.001$, confirming that no single symptom was statistically dominant and that awareness was broadly distributed across multiple presentations rather than concentrated on one hallmark indicator (Table 4).

Regarding anatomical susceptibility, participants were asked which regions they considered most vulnerable to overuse injuries. The elbow was identified most frequently (26.4%), followed by the shoulder (21.2%), knee (21.1%), ankle (18.4%) and wrist (18.3%). Hip and waist were less commonly selected at 13.2% and 7.7% respectively and 7.8% indicated they did not know. A Chi-Square Goodness-of-Fit test confirmed no statistically dominant region ($\chi^2 = 109.565$, $df = 6$, $p < 0.001$), suggesting athletes recognise injury risk across the full musculoskeletal spectrum rather than focusing on any one site (Table 5).

Exercises Perceived to Cause Overuse Injuries

Athletes were asked to identify which exercises or training drills they believed could cause or contribute to overuse injuries. Again, multiple selections were allowed. Back stretches were cited most frequently (21.2%), followed closely by jumping and landing (21.1%), sit-ups (21.0%) and cutting or pivoting movements (20.9%). A notable 18.4% reported they did not know, while stairs training was selected by 13.1% and sprinting by 10.6%. A Chi-Square Goodness-of-Fit test returned $\chi^2 = 58.064$ with five degrees of freedom and $p < 0.001$, confirming that no single exercise type was statistically preferred and that perceptions were spread broadly across a range of movement patterns (Table 6).

Training Load and Behavioural Responses

When asked how they would respond upon suspecting an overuse injury, the most common answer was "do not know," selected by 26.2% of athletes. A further 23.7% reported they would continue playing; a potentially harmful course of action. In contrast, 18.5% said they would consult a doctor, 18.4% would take a break from sport, 15.8% would review their training and 10.6% reported they would resort to self-medication. These findings highlight a widespread absence of structured injury management plans and raise concerns about behaviours that could accelerate tissue damage (Table 7).

On the question of whether training hours are related to overuse injury risk, 31.8% of athletes believed a relationship exists, 39.0% did not and 29.2% were unsure. A Chi-Square Goodness-of-Fit test yielded $\chi^2 = 13.795$ with two degrees of freedom and $p = 0.001$, indicating a

statistically significant but non-uniform distribution of beliefs, with outright disbelief being the most prevalent position (Table 8).

Perhaps the most clinically significant misconception emerged around weight training. A majority (50.1%) believed that weight training does not increase the risk of overuse injury, while only 16.3% believed it does and 33.6% were unsure. The chi-square test was highly significant ($\chi^2 = 155.046$, $df = 2$, $p < 0.001$), confirming that this disproportionate belief in the neutral or protective nature of resistance training is not a chance finding. This is particularly concerning given that progressive resistance loading without adequate recovery is a well-established risk factor for musculoskeletal overuse injuries in the clinical and sports science literature (Table 9).

Table 1: Awareness of Overuse Injury Questionnaire

Questions	Options
1. Have you ever heard the term overuse injury before?	I. Yes II. No III. Not sure
2. What are the signs that point towards overuse injuries?	I. Stiffness after rest or sleep II. Reduced range of motion III. Swelling IV. Unexplained fatigue V. Pain VI. Gradual decrease in performance VII. Tenderness on pressing a specific spot VIII. Do not know
3. What are the most common areas affected by overuse injuries?	I. Knee II. Hip III. Shoulder IV. Elbow V. Ankle VI. Wrist VII. Waist VIII. Do not know
4. What is to be done in case where you suspect overuse injury in a player?	I. Take break from sports II. Do Self-medication III. Consult a doctor IV. Continue playing V. Review training VI. Do not know
5. Is there any relation to number of hours of play/training in overuse injury?	I. Yes II. No III. Do not know
6. Is overuse injury more common in players who do weight training?	I. Yes II. No III. Do not know
7. Are you aware of any specific exercises/maneuvers which lead to overuse injuries?	I. Back stretches II. Sit-ups III. Jumping and landing IV. Stairs training V. Sprinting VI. Cutting/Pivoting VII. Do not know

Table 2: Participant Profile (n = 906)

Characteristics	Total Sample (%)
Age	
Less than 21 yrs.	525 (58.2%)
More than 21 yrs.	381 (41.8%)
Gender	
Male	580 (64%)
Female	326 (36%)
Sport	
Badminton	309 (34.2%)
Swimming	167 (18.4%)
Cricket	167 (18.4%)
Athletics	263 (29%)
Education	
Highschool or below	222 (24.5%)
Intermediate	173 (19.1%)
UG	276 (30.5%)
Above UG	235 (25.9%)
Competition	
None	194 (21.4%)
District Level	229 (25.3%)
State Level	183 (20.2%)
National Level	138 (15.2%)
International Level	162 (17.9%)
Years of competitive experience	
Less than 1 year	214 (23.6%)
1-3 year	428 (47.2%)
More than 3 years	264 (29.2%)
Average Training hours per week	
Less than 6 hours	148 (16.3%)
6-15 hours	437 (48.3%)
More than 15 hours	321 (35.4%)

Table 3: Overall Level of Awareness

Response	Total Sample (%)	Interpretation
Yes	209 (23.1%)	Aware
No	428 (47.2%)	Not Aware
Not Sure	269 (29.7%)	Uncertain

Table 4: Signs / Symptoms

Sign/Symptom	Total Sample (%)
Swelling	216 (23.8%)
Stiffness after rest/sleep	191 (21.1%)
Gradual decrease in performance	191 (21.1%)
Pain	167 (18.4%)
Unexplained fatigue	144 (15.9%)
Tenderness on pressing spot	118 (13%)
Reduced range of motion	96 (10.6%)
Do not know	94 (10.4%)

Table 5: Anatomical Regions

Anatomical Region	Total Sample (%)
Elbow	239 (26.4%)
Shoulder	192 (21.2%)
Knee	191 (21.1%)
Ankle	167 (18.4%)
Wrist	166 (18.3%)
Hip	120 (13.2%)
Waist	70 (7.7%)
Do not know	71 (7.8%)

Table 6: Exercises / Drills

Exercise / Drill	Total Sample (%)
Back Stretches	192 (21.2%)
Jumping and Landing	191 (21.1%)
Sit-ups	190 (21%)
Cutting / Pivoting	189 (20.9%)
Stairs Training	119 (13.1%)
Sprinting	96 (10.6%)
Do not know	167 (18.4%)

Table 7: Athlete-reported response to suspected overuse injury

Response Option	Total Sample (%)
Do not know	237 (26.2%)
Continue playing	215 (23.7%)
Consult a doctor	168 (18.5%)
Take break from sports	167 (18.4%)
Review training	143 (15.8%)
Self-medication	96 (10.6%)

Table 8: Relationship between training hours and overuse injury

Belief	Total Sample (%)
Yes	288 (31.8%)
No	353 (39%)
Not Sure	265 (29.2%)

Table 9: Relationship between weight training and overuse injury risk

Belief	Total Sample (%)
Yes (increases risk)	148 (16.3%)
No (does not increase risk)	454 (50.1%)
Not Sure	304 (33.6%)

DISCUSSION

The present cross-sectional study aimed to assess the awareness of overuse injuries among competitive athletes engaged in non-contact sports in Lucknow, India. The key finding that fewer than one in four athletes (23.1%) demonstrated genuine prior awareness of overuse injuries, while nearly half (47.2%) had never encountered the concept, represents a clinically significant deficit. The results of this study are broadly consonant with, yet also meaningfully extend, the existing

body of literature on overuse injury prevalence, risk perceptions and athlete beliefs.

Overall Level of Awareness and Prevalence Context

The low awareness documented in the present study must be contextualised against the well-established and substantial prevalence of overuse injuries in sport. Franco *et al.* (2021), in a systematic review with meta-analysis encompassing 24,704 athletes, reported a pooled period-prevalence of 42.0% (95% CI: 30.0–55.0) in individual sports and 33.0% (95% CI: 21.0–49.0) in team sports [12]. The fact that such injuries affect between one-third and nearly half of all competing athletes underscores the public health significance of poor awareness. The disconnect between the objective frequency of overuse injuries and the subjective awareness among athletes reinforces the observation of Aicale *et al.* (2018), who noted that the identification of overuse injuries constitutes a significant clinical challenge owing to their non-specific and misleading symptomatology [13]. From this perspective, the present finding that approximately one in four athletes was genuinely aware is not merely a knowledge gap but a patient safety concern: athletes who do not recognise early symptoms are unlikely to modify training behaviour, seek early medical attention or implement preventive strategies.

Demographic Correlates of Awareness: Experience, Training Volume and Sport Type

The present study found that awareness varied significantly with years of experience ($\chi^2 = 1337.616$, $p < 0.001$), weekly training hours ($\chi^2 = 144.263$, $p < 0.001$), sport type ($\chi^2 = 154.421$, $p < 0.001$) and competition level ($\chi^2 = 121.913$, $p < 0.001$). These associations suggest that familiarity with overuse injuries is largely acquired through prolonged exposure rather than formal education; a pattern consistent with the qualitative findings of van Wilgen and Verhagen (2012), who noted that athletes and coaches accumulate beliefs about overuse injuries primarily through lived experience of injury rather than systematic instruction [14].

Particularly notable is the absence of any significant association between formal education level and awareness in the present study. This contrasts with the expectation that higher academic attainment would translate into better health literacy. Similarly, the lack of significant variation across competition levels implies that structured sporting environments, including national and international competitive programmes, are not reliably transmitting this knowledge. Alfawaz (2023), in a comparable awareness study among young athletes in Saudi Arabia, similarly observed that institutional and coaching structures frequently fall short of providing comprehensive injury education and recommended the development of integrated, professionally supervised injury awareness programmes [11].

Recognition of Signs, Symptoms and Anatomical Regions

When asked to identify signs of overuse injury, the most commonly recognised indicator was swelling (23.8%), followed by stiffness after rest or sleep and gradual decrease in performance (each 21.1%). Pain was identified by only 18.4% of participants, which is notably low given that pain is considered the cardinal symptom of overuse tendinopathy in the clinical literature. Aicale *et al.* (2018) described pain as the primary and defining symptom of tendinopathy, typically occurring at the beginning and end of training sessions before progressing to continuous pain during exercise [13]. The under-recognition of pain as a defining feature in the present cohort reflects a knowledge gap that could delay care-seeking, as athletes may attribute episodic pain to general training soreness rather than an evolving overuse condition.

Regarding anatomical susceptibility, the elbow was identified most frequently (26.4%), followed by the shoulder (21.2%) and knee (21.1%).

These findings are broadly compatible with the literature. Aicale *et al.* (2018) identified the supraspinatus, common wrist extensor, quadriceps, patellar and Achilles tendons as among the most commonly affected structures in overuse tendinopathy, with the elbow and shoulder prominent in racquet and throwing sports [13]. Franco *et al.* (2021) similarly reported that sensitivity analyses across body regions demonstrated that the shoulder and knee were consistently among the highest-prevalence anatomical sites in both individual and team sports [12]. The recognition of the knee and elbow by athletes in the present sample likely reflects exposure to sport-specific injury narratives within their training contexts, rather than systematic anatomical knowledge. Notably, 7.8% of participants reported that they did not know which anatomical region was most vulnerable, a proportion that warrants attention given the fundamental importance of this knowledge for self-monitoring.

Behavioural Responses and Training-Load Misconceptions

Among the most clinically consequential findings of the present study is the pattern of intended behavioural responses upon suspecting an overuse injury. The most frequent response was "do not know" (26.2%), followed closely by "continue playing" (23.7%). Collectively, these responses indicate that approximately half of the athlete cohort lacked a structured or appropriate injury management plan. The tendency to continue playing in the presence of suspected injury directly mirrors the psychological dynamics described by van Wilgen and Verhagen (2012), who reported that athletes not taking adequate measures, including continuing to train and compete despite early symptoms, was a defining feature of the overuse injury process as described by athletes and coaches themselves [14].

The finding that the majority of participants (50.1%) believed weight training does not increase the risk of overuse injury, while only 16.3% correctly identified it as a risk factor, represents a particularly important misconception. The clinical and sports science literature is unambiguous on this point. Aicale *et al.* (2018) described progressive resistance loading without adequate recovery as a well-established contributor to musculoskeletal overuse pathology [13]. This belief likely arises from the popular association of resistance training with injury prevention and athletic development, obscuring the dose-dependent risks of progressive overload. Van Wilgen and Verhagen (2012) similarly noted that athletes tended to frame overuse injuries in terms of imbalance between training and rest, yet seldom identified specific resistance training modalities as contributing causes [14]. Similarly, only 31.8% of athletes believed a relationship exists between training hours and overuse injury risk, while 39.0% actively disbelieved such a relationship. This contradicts the epidemiological evidence: Franco *et al.* (2021) documented that athletes from individual sports, who are exposed to higher repetitive training demands concentrated in a single individual, demonstrated a higher period-prevalence of overuse injuries compared to team sport athletes [12].

Comparison with Other Awareness Studies

Comparisons with the Alfawaz (2023) study from the western region of Saudi Arabia are instructive, as this represents one of the few other awareness studies conducted in a developing country sports context. Alfawaz reported that the majority of his sample of 257 young athletes possessed adequate knowledge about injury rehabilitation and preventive exercise under professional supervision. However, that study was broader in scope, addressing general sports injuries including traumatic injuries and recruited primarily football players through institutional sport structures [11]. In contrast, the present study specifically isolated overuse injuries, a conceptually more demanding construct, in a non-contact sports cohort across four distinct disciplines. It is therefore plausible that the athletes in the Alfawaz study demonstrated general injury literacy without necessarily possessing specific awareness of overuse injury mechanisms.

The high prevalence of overuse injuries documented by Franco *et al.* (2021) establishes the epidemiological basis for concern ^[12]. The clinical complexity and tissue-specific pathology elaborated by Aicale *et al.* (2018) explains why these injuries are difficult to identify without structured knowledge ^[13]. The qualitative insights of van Wilgen and Verhagen (2012) reveal that experiential, biopsychosocially framed beliefs dominate athletes' and coaches' understanding, while formal scientific knowledge remains largely absent ^[14]. And the contextual comparison with AlFawaz (2023) highlights that awareness of general injury does not translate automatically into awareness of the specific and subtle phenomenon of overuse pathology ^[11].

Limitations

The present study has several limitations that should be acknowledged. As a cross-sectional survey, it cannot establish causality between demographic variables and awareness levels, nor can it determine how awareness changes over time. The use of a self-structured questionnaire, while validated by a panel of experts, differs from standardised instruments, limiting direct quantitative comparisons. The study was conducted in Lucknow alone and its results may not generalise to athletes in other regions of India with different sporting cultures, training infrastructure or access to sports medicine services. The restriction to non-contact sports, while appropriate for the study's objectives, means that the findings cannot be compared directly with studies encompassing contact or collision sports, which account for a large proportion of the existing awareness and prevalence literature. Nevertheless, the study's large sample size (n = 906), strong response rate (87%) and inclusion of four distinct non-contact sport disciplines, strengthen confidence in the representativeness of its findings within this specific population.

CONCLUSION

The results reveal a concerning lack of awareness: fewer than one in four competitive athletes understood overuse injuries; nearly half had never heard of the concept. Awareness correlated with experience and training volume but not formal education or competition level, indicating current academic and sporting systems fail to address this issue effectively.

This study strongly supports developing targeted sports health education programs in India and similar contexts. These should cover overuse injury mechanisms (distinguishing covert from traumatic), early symptom recognition (pain, stiffness, performance decline), sport-specific anatomical vulnerabilities, training volume risks and proper help-seeking. Coaches, physiotherapists and sports scientists are ideal educators due to their trusted roles.

Future research should fill gaps by conducting longitudinal studies on educational interventions' impact on awareness and injury reduction among non-contact sport athletes. Larger multi-sport, multi-city studies would yield robust prevalence data and clarify how awareness varies by sport type, training context and culture.

Acknowledgements

The authors would like to thank all the participants who supported and participated in this study.

Author Contributions

NS conceptualized and designed the study. Manuscript preparation was done by NS and PS. Data acquisition was done by NS. All authors reviewed and approved the final manuscript.

Data Availability Statement

The data that support the findings of this study are available and will be made available upon request.

Use of AI in Drafting of Manuscript

The authors declare that they have not used any generative AI/AI-assisted technologies in the writing of this manuscript.

Conflicts of interest

None declared.

Financial Support

None declared.

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