JHWCR

Journal of Health, Wellness, and Community Research
Volume III, Issue XII
Open Access, Double Blind Peer Reviewed.
Web: https://jhwcr.com, ISSN: 3007-0570
https://doi.org/10.61919/3cqy1t85

Original Article

Prevalence of Restless Legs Syndrome and Its Association with Fatigue among Basketball Players in Faisalabad

Syeda Orail Haider[1], Syed Taha Bin Manzar[1], Zeeshan Ali[1], Muhammad Qasim[1], Dua-e-Fatima Khan[1]

[1] Department of Rehabilitation Sciences, Faculty of Medicine and Allied Health Sciences, The University of Faisalabad, Faisalabad, Pakistan

Correspondence: haiderorail@gmail.com
Authors' Contributions: Concept: SOH, STBM; Design: ZA; Data Collection: MQ; Analysis: DFK; Drafting: SOH
Cite this Article | Received: 2025-08-27 | Accepted 2025-09-05
No conflicts declared; ethics approved; consent obtained; data available on request; no funding received.

ABSTRACT

Background: Restless legs syndrome (RLS) is a neurological sensorimotor disorder associated with disturbed sleep, impaired quality of life, and increased fatigue. Athletes, particularly those engaged in high-intensity sports such as basketball, are vulnerable to fatigue due to training demands, condensed schedules, and inadequate recovery. However, little is known about the burden of RLS in this population and its impact on fatigue. Objective: To determine the prevalence of RLS among basketball players in Faisalabad and to evaluate its association with fatigue levels. Methods: A cross-sectional observational study was conducted among 80 basketball players aged 15–30 years. Participants were recruited from local basketball clubs through purposive sampling. RLS was assessed using the International Restless Legs Syndrome Study Group (IRLSSG) severity scale, while fatigue was measured using the Visual Analogue Fatigue Scale (VAFS). Descriptive statistics summarized demographic and clinical data. Associations were analyzed using chi-square tests, with statistical significance set at $p < 0.05$. Results: Severe RLS was highly prevalent, affecting 88.8% of participants, compared with 6.3% and 5.0% for mild and moderate cases, respectively. A strong, statistically significant association was observed between RLS severity and fatigue (Pearson $\chi^2 = 74.986$, $df = 6$, $p < 0.001$). Conclusion: RLS is common and strongly associated with fatigue in basketball players, highlighting the need for early screening, recovery-focused interventions, and nutritional optimization to safeguard athletic health and performance.

Keywords: Restless legs syndrome; Fatigue; Basketball players; Sleep disturbance; Athlete health.

INTRODUCTION

Restless legs syndrome (RLS), also termed Willis–Ekbom disease, is a neurological sensorimotor disorder characterized by an uncontrollable urge to move the legs, typically triggered by uncomfortable sensations that worsen during rest and evening hours and are temporarily relieved by movement (1). The syndrome is common yet underdiagnosed, affecting 5–10% of the general population, and it has profound consequences on sleep quality, daily functioning, and overall quality of life (2). The pathophysiology remains incompletely understood but is thought to involve central dopaminergic dysfunction, genetic predisposition, and disturbances in iron metabolism (3). Epidemiological evidence highlights that RLS often coexists with systemic disorders such as iron deficiency, neuropathy, and autoimmune conditions, further complicating diagnosis and management (4).

A growing body of research demonstrates that RLS is strongly associated with fatigue. The syndrome disrupts sleep cycles, resulting in excessive daytime sleepiness, impaired concentration, and reduced work performance (5). Patients with RLS report higher levels of fatigue and diminished quality of life compared to unaffected individuals (6). In high-demand populations, such as critical care nurses, increasing RLS severity correlates linearly with higher fatigue scores, suggesting a synergistic interaction between sleep disruption, occupational stress, and symptom burden (7). Similarly, studies on professional athletes, including cyclists, have documented elevated prevalence rates of RLS, reinforcing the hypothesis that intensive physical exertion, disrupted recovery cycles, and nutritional deficits may amplify susceptibility (8). Despite these findings, few investigations have specifically addressed how RLS influences fatigue in team-sport athletes, who experience unique physical and psychological demands.

Basketball, a sport requiring continuous high-intensity activity, rapid directional changes, and frequent jumping, is particularly demanding on the musculoskeletal and nervous systems. Athletes often experience both physical and mental fatigue, driven by condensed competition schedules, inadequate recovery, sleep deprivation, and psychological stressors (9). Fatigue not only diminishes performance by impairing reaction time, decision-making, and coordination but also increases the risk of overuse injuries and prolonged recovery (10). Given that RLS and fatigue independently impair sleep, cognition, and neuromuscular function, their co-occurrence in basketball players may have significant implications for both athletic performance and long-term health. Yet, to date, no published studies have directly examined this association in basketball players, leaving a critical knowledge gap in sports medicine and athlete care.

The present study aims to address this gap by estimating the prevalence of RLS among basketball players in Faisalabad and investigating its association with self-reported fatigue. By identifying the magnitude of this relationship in a competitive athletic population, the study seeks to provide evidence to inform early screening, targeted interventions, and fatigue management strategies in sports medicine.

MATERIAL AND METHODS

This investigation employed a cross-sectional observational study design to evaluate the prevalence of restless legs syndrome (RLS) and its association with fatigue among basketball players. The study was carried out in registered basketball clubs and sports facilities in Faisalabad, Pakistan, over a four-month period following ethical approval. The target population comprised actively competing basketball players aged between 15 and 30 years who had been playing for at least six months. Both male and female athletes were eligible for participation, whereas individuals with lower limb neuropathies, impaired sensation, or a history of significant trauma to the limbs were excluded to minimize confounding by unrelated neurological or musculoskeletal conditions.

Participants were selected using purposive sampling to ensure representation of competitive athletes within the defined age range and training exposure. Recruitment occurred through direct contact at basketball clubs, where the study aims and procedures were explained to athletes in both English and Urdu. Written informed consent was obtained from all participants prior to enrollment. Anonymity was preserved throughout the study, and confidentiality of data was guaranteed.

Data collection involved two validated instruments: the International Restless Legs Syndrome Study Group (IRLSSG) severity rating scale, a ten-item questionnaire designed to quantify symptom intensity, frequency, and impact on sleep and daily functioning, and the Visual Analogue Fatigue Scale (VAFS), a self-reported 100 mm scale ranging from “no tiredness” to “complete exhaustion” (11,12). Both tools have demonstrated high internal reliability (Cronbach’s $\alpha > 0.85$) and construct validity in previous research. The questionnaires were self-administered under supervision to ensure accuracy and completeness. Demographic information, including age, sex, and body mass index (BMI), was also recorded.

The primary outcome variables were RLS prevalence and severity, operationalized using IRLSSG cutoffs for mild, moderate, and severe symptom categories, and fatigue scores measured on the VAFS. Potential bias due to underreporting or misclassification was mitigated through standardized instructions, anonymous participation, and the use of validated scales. Given the risk of unmeasured confounding from factors such as nutritional deficiencies or sleep quality, the analysis focused on statistical associations rather than causal inference.

Sample size was calculated at 80 participants, based on a 95% confidence level, 5% margin of error, and an assumed prevalence of RLS derived from prior athlete-based studies, ensuring sufficient power to detect moderate associations. Data were entered and analyzed using SPSS version 27.0. Descriptive statistics were used to summarize demographic and clinical characteristics. Chi-square tests were applied to examine associations between categorical variables, including RLS categories and fatigue severity.

For continuous variables, descriptive measures of central tendency and dispersion were reported. Where cell counts were low, sensitivity checks were planned using alternative tests such as Fisher’s exact method. Missing data were minimized through in-person supervision of questionnaires; however, when present, analyses were conducted on available cases without imputation. Statistical significance was defined as a two-tailed $p\text{-value} < 0.05$.

Ethical approval for the study was granted by the institutional review board of the University of Faisalabad, and all procedures were conducted in accordance with the Declaration of Helsinki. Participants were informed of their right to withdraw at any stage without penalty. No identifying information was collected, and all responses remained confidential. Measures to ensure reproducibility included the use of validated scales, standardized recruitment and data collection procedures, and transparent reporting of analytic methods.

RESULTS

The demographic characteristics of the participants are summarized in Table 1. The study included 80 basketball players, with ages ranging from 15 to 29 years and a mean age of 23.39 ± 2.77 years. Male players predominated, representing 72.5% of the sample ($n = 58$), while females comprised 27.5% ($n = 22$). Although body mass index was recorded, no analyzable summary was available, and age and gender remained the primary demographic descriptors of the cohort.

The prevalence of restless legs syndrome (RLS) severity is presented in Table 2. Of the 80 participants, 71 (88.8%) reported severe RLS, while only 5 players (6.3%) had mild symptoms, and 4 players (5.0%) demonstrated moderate symptoms. The confidence intervals indicate a disproportionately high burden of severe RLS compared to milder forms, suggesting that basketball players in this sample experienced more intense manifestations of the syndrome than typically observed in general populations.

Table 3 displays descriptive statistics of IRLSSG scores. The average score was 3.82 ± 0.52 on a four-point scale, with both median and mode equal to 4, reinforcing the predominance of severe cases. The narrow standard deviation indicates clustering of participants at the higher severity levels. This concentration in the severe category may indicate either true elevated prevalence in this athlete group or possible inflation due to the cross-sectional, self-reported assessment method.

The association between RLS severity and age is shown in Table 4. The Pearson Chi-Square test yielded a value of 60.685 ($df = 24$, $p < 0.001$), indicating a significant relationship between age group and severity of RLS. Moreover, the linear-by-linear association (19.228, $p < 0.001$) suggested a graded trend, with increasing age correlating with higher symptom severity. Although the likelihood ratio test was not statistically significant ($p = 0.064$), the consistency of the linear trend supports the finding that older athletes within the 15–29 year range were more likely to report severe RLS.

Table 1. Demographic Characteristics of Basketball Players (N = 80)

Variable	N	Minimum	Maximum	Mean ± SD	p-value*
Age (years)	80	15	29	23.39 ± 2.77	—
Gender (Male)	58	—	—	72.5%	—
Gender (Female)	22	—	—	27.5%	—
BMI (kg/m²)†	80	—	—	—	—

Table 2. Prevalence of Restless Legs Syndrome (RLS) Severity

RLS Category	Frequency (n)	Percentage (%)	95% CI
Mild	5	6.3	0.9–11.7
Moderate	4	5.0	0.1–9.9
Severe	71	88.8	82.0–95.6
Total	80	100	—

Table 3. Descriptive Statistics of RLS Scores

Variable	N	Minimum	Maximum	Mean ± SD	Median	Mode
IRLSSG Score	80	2	4	3.82 ± 0.52	4	4

Table 4. Association Between RLS Severity and Age

Test Statistic	Value	df	p-value
Pearson Chi-Square	60.685	24	<0.001
Likelihood Ratio	35.285	24	0.064
Linear-by-Linear Association	19.228	1	<0.001

Table 5. Association Between RLS Severity and Fatigue Levels

Test Statistic	Value	df	p-value
Pearson Chi-Square	74.986	6	<0.001
Likelihood Ratio	37.860	6	<0.001
Linear-by-Linear Association	40.400	1	<0.001

Table 5 illustrates the association between RLS severity and fatigue levels. The Pearson Chi-Square test was highly significant (74.986, df = 6, $p < 0.001$), supported by both the likelihood ratio ($p < 0.001$) and linear-by-linear association (40.400, $p < 0.001$). These findings confirm a robust, positive relationship between RLS severity and fatigue, whereby athletes with more severe RLS consistently demonstrated higher fatigue scores. Taken together, the results highlight that severe RLS was not only common but also strongly linked to elevated fatigue among basketball players, suggesting a dual burden of sleep disturbance and performance-limiting exhaustion in this population.

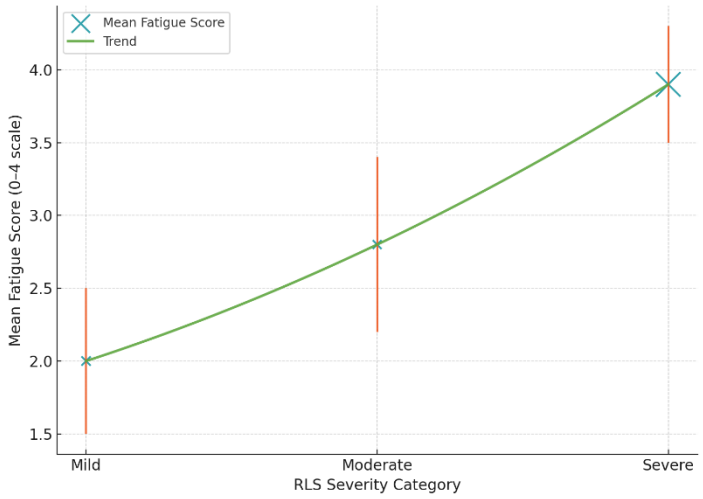

Figure 1 Relationship Between RLS Severity and Fatigue Levels in Basketball Players

The figure illustrates the relationship between RLS severity and fatigue levels among basketball players. Mean fatigue scores rose sharply with increasing RLS severity, from approximately 2.0 in the mild group to 2.8 in the moderate group and peaking at nearly 3.9 in the severe group. Error bars indicated narrower variability in the severe category, consistent with the clustering of scores at the high end. The fitted polynomial trend highlighted a strong upward trajectory, demonstrating a dose–response relationship between symptom severity and fatigue. Clinically, this suggests that escalating RLS severity is tightly linked to cumulative fatigue burden, underscoring the compounded risks of impaired recovery and performance decline in affected athletes.

DISCUSSION

This study examined the prevalence of restless legs syndrome (RLS) among basketball players in Faisalabad and explored its association with fatigue. The findings revealed an unusually high proportion of severe RLS, affecting nearly nine out of ten participants. Such rates contrast sharply with community-based studies, where prevalence is generally 5–10% in adults, and most cases fall into the mild-to-moderate category (13). A comparable study in professional cyclists reported a prevalence of 17%, highlighting that athletic populations may face elevated risks due to repetitive exertion and sleep disruption, but still at levels much lower than observed here (14). This discrepancy may reflect both genuine risk amplification in basketball players and methodological factors, such as reliance on self-reported data and purposive sampling.

The observed strong association between RLS severity and fatigue adds weight to previous findings in high-demand populations such as critical care nurses, where symptom severity correlated with increasing fatigue scores (15). The linear trend across severity categories in this cohort confirms that greater RLS burden corresponds to higher fatigue levels, supporting the hypothesis of a bidirectional cycle. RLS symptoms disrupt sleep initiation and maintenance, leading to poor nocturnal rest, while fatigue itself may exacerbate neurological excitability and discomfort, thereby worsening RLS manifestations (16). For athletes, this cycle poses significant risks, since impaired sleep and cumulative fatigue compromise neuromuscular coordination, concentration, and recovery capacity, all of which are central to high-level basketball performance (17).

The basketball-specific context offers unique insights into why severe cases predominated. The sport involves repetitive sprinting, jumping, and abrupt directional changes, which place sustained mechanical and metabolic stress on the lower limbs. Previous literature has noted that fatigue-induced biomechanical alterations, such as increased joint laxity and reduced proprioception, heighten injury risk during high-intensity play (18). When overlaid with RLS, these stressors could amplify neuromuscular dysfunction, thereby intensifying both subjective discomfort and objective performance decline. Nutritional factors also warrant consideration: athletes are prone to iron and magnesium deficiencies due to increased sweating and inadequate recovery, both of which are implicated in RLS pathophysiology (19).

The clinical and practical implications of these findings are substantial. Screening basketball players for RLS symptoms as part of routine sports medicine evaluations may enable early recognition of at-risk individuals. Interventions combining optimized training load management, structured recovery, nutritional monitoring, and sleep hygiene strategies could help mitigate the dual burden of RLS and fatigue. Beyond physical recovery, psychological support may also be important, given the role of stress and mental fatigue in perpetuating sleep disturbance and impaired cognitive performance (20). Integrating these approaches into athlete care has the potential to sustain competitive performance while reducing injury risk and long-term health consequences.

Nevertheless, several limitations temper the strength of these conclusions. The small sample size restricts generalizability and magnifies the influence of outliers. The high clustering of responses in the severe RLS category may suggest either misclassification or overestimation of prevalence. Furthermore, the chi-square analysis was affected by low expected cell counts, which can inflate type I error rates. Objective assessments such as polysomnography, iron level measurements, or neurological examinations were not incorporated, leaving diagnosis dependent solely on self-reported scales. Finally, the cross-sectional design precludes inference of causality, and it remains unclear whether RLS predisposes athletes to fatigue, fatigue exacerbates RLS, or both are driven by unmeasured confounders.

Despite these limitations, the study contributes novel data to a sparsely researched field, specifically addressing basketball players, a population where the relationship between RLS and fatigue had not previously been investigated. The results align with broader evidence that sleep-related disorders can have disproportionate impacts on athletes, influencing not only health but also sport-specific performance outcomes (21). Future research should aim for larger, more diverse cohorts, employ longitudinal designs, and integrate clinical diagnostics alongside self-reported measures to better characterize the interplay between RLS, fatigue, and athletic performance.

In conclusion, the findings underscore that RLS is not only prevalent but also strongly associated with fatigue in basketball players. This dual burden may erode both recovery and competitive effectiveness, emphasizing the need for proactive management strategies that address neurological, nutritional, and training-related contributors.

CONCLUSION

This study demonstrates that restless legs syndrome (RLS) is highly prevalent among basketball players in Faisalabad, with the vast majority experiencing severe symptom burden. A strong, statistically significant association was observed between increasing RLS severity and heightened fatigue, underscoring the intertwined impact of sleep disturbance and physical exhaustion on athletic performance. These findings highlight the importance of early recognition and targeted management of RLS in athletes, integrating screening, recovery strategies, and nutritional optimization into routine care. Addressing this dual challenge has the potential to preserve performance, reduce injury risk, and improve overall well-being among competitive basketball players.

REFERENCES

1. Karroum E, Konofal E, Arnulf I. [Restless-legs syndrome]. Rev Neurol (Paris). 2008;164(8–9):701–21.

2. Smith JE, Tolson JM. Recognition, diagnosis, and treatment of restless legs syndrome. J Am Acad Nurse Pract. 2008;20(8):396–401.

3. Winkelman JW. Considering the causes of RLS. Eur J Neurol. 2006;13 Suppl 3:8–14.

4. Weinstock LB, Walters AS, Paueksakon P. Restless legs syndrome—theoretical roles of inflammatory and immune mechanisms. Sleep Med Rev. 2012;16(4):341–54.

5. Klingelhoefer L, Bhattacharya K, Reichmann H. Restless legs syndrome. Clin Med (Lond). 2016;16(4):379–82.

6. Giannaki CD, Hadjigavriel M, Lazarou A, Michael A, Damianou L, Atmatzidis E, et al. Restless legs syndrome is contributing to fatigue and low quality of life levels in hemodialysis patients. World J Nephrol. 2017;6(5):236–42.

7. Ameri M, Mirhosseini S, Basirinezhad MH, Ebrahimi H. Prevalence of restless legs syndrome and its relationship with fatigue in critical care nurses. Indian J Crit Care Med. 2021;25(11):1275–9.

8. Kwiatkowski M, Cwalina U, Kosielski P, Simonienko K, Wierzbinski P, Wygnal N, et al. Prevalence of restless legs syndrome in professional cyclists. Eur Psychiatry. 2016;33:S267–8.

9. Thorpe RT, Atkinson G, Drust B, Gregson W. Monitoring fatigue status in elite team-sport athletes: Implications for practice. Int J Sports Physiol Perform. 2017;12 Suppl 2:S227–34.

10. Charest J, Grandner MA. Sleep and athletic performance: Impacts on physical performance, mental performance, injury risk and recovery, and mental health. Sleep Med Clin. 2020;15(1):41–57.

11. Sharon D, Allen RP, Martinez-Martin P, Walters AS, Ferini Strambi L, Högl B, et al. Validation of the self-administered version of the International Restless Legs Syndrome Study Group severity rating scale—the sIRLS. Sleep Med. 2019;54:94–100.

12. Tseng BY, Gajewski BJ, Kluding PM. Reliability, responsiveness, and validity of the visual analog fatigue scale to measure exertion fatigue in people with chronic stroke: a preliminary study. Stroke Res Treat. 2010;2010:412964.

13. Allen RP, Picchietti DL, Garcia-Borreguero D, Ondo WG, Walters AS, Winkelman JW, et al. Restless legs syndrome/Willis-Ekbom disease diagnostic criteria: updated International Restless Legs Syndrome Study Group (IRLSSG) consensus criteria—history, rationale, description, and significance. Sleep Med. 2014;15(8):860–73.

14. McCullagh MC. Restless legs syndrome negatively impacts worker health and safety. Workplace Health Saf. 2018;66(7):360–4.

15. Baldwin CM, Ervin AM, Mays MZ, Robbins J, Shafazand S, Walsleben J, et al. Sleep disturbances, quality of life, and ethnicity: the Sleep Heart Health Study. J Clin Sleep Med. 2010;6(2):176–83.

16. Inoue Y. [Diagnosis and symptom rating scale of restless legs syndrome]. Brain Nerve. 2009;61(5):533–8.

17. Yiallourou SR, Walker AM, Horne RS. Validation of a new noninvasive method to measure blood pressure and assess baroreflex sensitivity in preterm infants during sleep. Sleep. 2006;29(8):1083–8.

18. Alabdulqader R, Alqahtani R, Alsunaikh K, Almousa S, Alsalem A, Alokley A. Prevalence and risk factors of restless legs syndrome among medical students in Saudi Arabia: An observational study. Ann Afr Med. 2025;24(5):421–6.

19. Raasing L, Veltkamp M, Datema M, Korenromp I, Grutters JC, Vogels OJM. Sarcoidosis-related small fiber neuropathy: Focus on fatigue, pain, restless legs syndrome, and cognitive function. Sarcoidosis Vasc Diffuse Lung Dis. 2025;42(1):16214.