

The Influence of Indoor Football on Professional Football Players: Injury Risk, and Long-Term Career Implications

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Abstract

Futsal, a fast-paced variant of indoor football, is increasingly popular among Sri Lankan professional footballers due to its accessibility and skill-enhancing potential. However, many players engage in futsal casually during off-season or leisure time, often underestimating the associated injury risks. Despite its growing popularity, limited research has examined the impact of futsal on injury patterns and player health in South Asia. This study investigates the relationship between futsal participation and injury risk among professional footballers in Sri Lanka, examining injury types, severity, and training implications. A cross-sectional, mixed-methods study was conducted from February to May 2025 involving 300 male professional footballers (mean $\pm$ SD: age 25.3 ± 4.7 years) from National, Premier League, and Division I teams. Structured questionnaires captured futsal exposure, training volumes, and injuries sustained over the past year. Statistical analysis was conducted using PSPP software, with Fisher's Exact Test used to assess significance. Futsal participation was reported by 54% of players, with 32.3% experiencing at least one indoor injury. A significant association was found between futsal involvement and injury occurrence ($p = 0.0163$). Most injuries affected the lower limbs, particularly the ankle, hip/groin, and knee, and were primarily due to overuse. Injuries peaked during weeks 3–4 of preseason. Many players engaged in futsal informally, lacking injury prevention awareness. While futsal offers technical benefits, it poses notable injury risks, especially when played casually. Structured conditioning, load management, and injury education are critical for minimizing risks and supporting long-term athlete well-being.

Keywords: Futsal Participation, Indoor Soccer Injuries, Injury Risk, Professional Footballers

Introduction

Football is the world's most popular sport, played and watched by millions globally (1). Its universal appeal is evident in how it captivates audiences and inspires participation across continents and cultures. The sport's simplicity, requiring minimal equipment, and its dynamic nature contribute to its widespread popularity (2).

In recent years, Sri Lanka has witnessed a growing passion for soccer, reflecting the global trend. The football's rise in popularity can be attributed to increased media coverage, youth development programs, and community initiatives aimed at promoting physical activity through soccer. Moreover, the establishment of local leagues and the success of Sri Lankan players in international competitions have further fuelled enthusiasm for the sport (3,4). There are four football competitions in Sri

Lanka: the Sri Lanka Football Premier League, Division I, Division II, and Division III, especially featuring over 20 clubs competing in the Premier League and Division I (5,6).

Indoor soccer, commonly known as futsal, is now gaining significant traction in Sri Lanka. This variant of soccer is played on a smaller, indoor court, which offers several advantages over traditional outdoor soccer. One of the primary reasons for its growing popularity is its accessibility—futsal can be played regardless of weather conditions, making it a year-round activity (7). Additionally, the smaller team size and faster-paced gameplay provide an engaging and challenging experience for players of all skill levels.

In response to the growing popularity of indoor football, high-quality facilities have rapidly emerged, with over 25 indoor courts established in Sri Lanka's capital city alone, as indicated by Google Maps. These venues provide ample opportunities for both recreational and competitive play. Professional footballers increasingly incorporate indoor football into their off-season routines for skill development and recreational engagement. Despite its potential benefits—such as improved agility, ball control, and quick decision-making—indoor football also introduces unique challenges, including increased injury risks due to smaller pitch dimensions, harder surfaces, and altered movement dynamics (8). However, a notable concern is that many professional players participate in futsal informally, often as a leisure-time activity, driven by a poor perception of its potential injury risks. Despite these concerns, limited empirical research has examined the implications of indoor football on professional players' performance, injury susceptibility, and long-term career sustainability. Therefore, this study investigates the role of indoor football in shaping professional footballers' training patterns, injury profiles, and overall career progression.

Literature Review

Futsal and indoor football, played on smaller courts (~40 × 20 m) with fewer players, impose high physical demands through frequent accelerations, decelerations, and multidirectional changes. A national survey in the Netherlands recorded an injury incidence of 55.2 per 10,000 hours—higher than many

outdoor football formats—attributable to the low pitch-to-player ratio and increased collisions (9). Junge and Dvorak's (10) analysis of three Futsal World Cups reported a startling 195.6 injuries per 1,000 player-hours, with 70% affecting the lower extremities. Most injuries resulted from contact or rapid non-contact movements like cutting and pivoting. Iranian futsal teams exhibit similar patterns: over one-third of injuries stem from non-contact mechanisms, with lower-limb injuries predominant (11). The hard, non-yielding indoor flooring exacerbates injury risk. Research in floorball (a pivoting indoor sport) showed that artificial surfaces doubled traumatic injury rates (59.9 vs. 26.8 injuries per 1,000 hours) compared to wooden floors, with non-contact injuries 12.5 times more likely on artificial surfaces (12). Rapid deceleration and repeated pivoting place large loads on joints. Players report greater strain on knees, hips, and lower back in indoor settings due to break-forced top speeds and friction forces, the low-bounce futsal ball and hard floors promote toe pokes and fixed-foot movements, which put extra stress on the ankles and knees (13). While ergonomics within the Sri Lankan context has been studied—focusing on school students' awareness, there is a lack of literature on sports ergonomics, including football. A recent study revealed Sri Lankan students had low perception and knowledge of general ergonomics (14). Extending this insight, it is probable that sports-related ergonomic principles—such as proper footwear, warm-up protocols, movement training, and awareness of surface interaction—are also underdeveloped in Sri Lanka's indoor football community.

Methodology

We conducted a cross-sectional, mixed-methods study from February to May 2025 involving 300 male professional footballers (mean ± SD: age 25.3 ± 4.7 years) drawn from Sri Lanka's National, Premier League, and Division I teams. Invitations were extended through club staff, who distributed study information and participant consent forms. Each club designated

a liaison responsible for data collection and ensured participants' understanding of the study's aims, procedures, confidentiality, and voluntary nature. Quantitative data were analyzed using PSPP, a free and open-source statistical software designed as an alternative to SPSS, enabling robust descriptive and inferential statistical analysis for this research (15).

A structured questionnaire captured:

- *Demographics*: age, height, playing position, club level.
- *Indoor football (futsal) exposure*: participation history (yes/no), frequency (sessions/week), duration (minutes).
- *Training regime*: weekly outdoor vs. indoor training volumes.
- *Injury history*: number and type of injuries in the past 12 months, distinguishing indoor vs. outdoor injuries.

Injury was defined as any physical complaint incurred during futsal that required medical attention or led to cessation of futsal activity, consistent with prior consensus definitions also the players recorded injuries using the form with injury type, location, recurrence, and days lost.

Descriptive statistics (mean $\pm$ SD, frequencies, percentages) characterized the sample.

A 2 $\times$ 2 contingency table compared futsal participation (Yes/No) $\times$ indoor football injury (Yes/No).

	Indoor injury Yes	Indoor injury No
Futsal Yes	a	b
Futsal No	c	d

Fisher's Exact Test determined association significance:

$$p = \frac{a! \cdot b! \cdot c! \cdot d! \cdot n!}{(a+b)! \cdot (c+d)! \cdot (a+c)! \cdot (b+d)!}$$

Where, a, b, c, and d are cell values in a 2 $\times$ 2 contingency table, n=a+b+c+d

Analysis and Discussion

Table 1 summarizes the demographic and participation details. Futsal Participation: 54.0% (n = 162) of players reported regular futsal involvement. Indoor Injuries: 97 players (32.3%) reported at least one futsal-related injury in the past year.

Variable	Value
Age (years)	25.3 $\pm$ 4.7
Height (cm)	176.4 $\pm$ 6.2
Body Mass (kg)	71.8 $\pm$ 7.1
Level of Play	
- National Team	24 (8.0%)
- Premier League	158 (52.7%)
- Division I	118 (39.3%)
Playing Position	
- Goalkeeper	28 (9.3%)
- Defender	94 (31.3%)
- Midfielder	107 (35.7%)
- Forward	71 (23.7%)
Futsal Participation	
- Yes	162 (54.0%)
- No	138 (46.0%)

Variable	Value
Indoor Injury (Past 12 Months)	
- Yes	97 (32.3%)
- No	203 (67.7%)
Training Volume (weekly)	
- Outdoor Football (hours/week)	7.9 ± 2.5
- Futsal (if applicable) (hours/week)	3.4 ± 1.2

A significant relationship was found between futsal participation and the occurrence of indoor injuries, as determined by Fisher's Exact Test ($p = 0.0163$), indicating that professional footballers who engaged in futsal were more likely to sustain injuries during indoor football compared to those who did not. Among all reported injuries, the vast majority (92.1%) involved the lower limbs. The most frequently affected areas were the ankle (21.0%), hip/groin (19.4%), knee (19.4%), and thigh (17.7%), followed by injuries to the lower leg/Achilles tendon (6.5%), foot/toe (6.5%), head/neck (3.2%), shoulder/clavicle (1.6%), and lower back/pelvis/sacrum (1.6%). No significant association was observed between injury location and the context in which the injury occurred (match or training), with a chi-square value of 0.53 ($p = 0.83$). Regarding the type of injury, muscle rupture, tear, or strain was the most common diagnosis (32.3%), followed by ligament sprains (29.0%), tendon-related issues (17.7%), contusions (9.7%), skin lacerations (3.2%), and cartilage or meniscus damage (3.2%). Again, no significant difference was detected in injury type between match and training contexts ($p = 0.31$, $\chi^2 = 0.47$).

Overuse injuries accounted for the majority (60.7%), while 39.3% were due to traumatic causes. Most injuries (58.5%) occurred without contact, particularly during training sessions, where 71.1% of injuries were non-contact. In contrast, during matches, contact injuries were more frequent, with 50.0% resulting from player collisions. Additional causes included contact with the ball (11.3%) and other objects (7.5%). A statistically significant relationship was observed between the cause of injury and the match or training context ($\chi^2 = 0.008$, $p < 0.01$),

highlighting the more physical nature of match play. The average time lost per injury was 5.7 ± 9.5 days, with players missing an average of 5.6 ± 7.8 training sessions and 1.3 ± 1.9 matches. In terms of injury severity, most were classified as minimal (61.3%), while 16.1% were mild, 19.4% moderate, and only 3.2% severe. Injury recurrence was reported in 11.3% of players, categorized into early recurrence (6.5%), late recurrence (3.2%), and delayed recurrence (1.6%). No significant differences in severity or recurrence were found between training and match injuries ($p = 0.52$ and 0.95 , respectively).

Injury distribution across the preseason training cycle revealed that the highest proportion (42.6%) of injuries occurred during the third and fourth weeks, suggesting a critical period of increased physical demand. The remaining injuries were relatively evenly split between the first two weeks (29.5%) and the final two weeks (27.9%) of the preseason. This distribution indicates that mid-preseason may present a higher risk period for injury, potentially due to cumulative fatigue or increased training intensity.

This study is among the first in South Asia to examine the influence of futsal on injury risk and career-related outcomes in professional football players. The results reveal a statistically significant association between futsal participation and higher rates of indoor football injuries. These findings align with global trends where fast-paced, high-impact indoor formats lead to elevated injury risks—particularly involving the ankle, knee, and hip.

Despite this, players also reported using futsal to enhance ball control, spatial awareness, and reaction speed—benefits confirmed in existing

literature. However, the constrained environment, harder surfaces, and rapid directional changes may intensify joint and ligament stress, particularly without surface-specific conditioning. The majority of injuries were minimal or mild, causing players to miss less than a week of training or competition. This highlights the repetitive strain nature of indoor football, with overuse injuries comprising 60.7% of all cases. The observed spike in injury incidence during weeks 3–4 of preseason suggests a period of elevated physiological load, emphasizing the need for graduated load management and recovery planning during this period.

Although the study presents robust descriptive data, limitations include recall bias in self-reported injuries and inability to control exposure variability across players. Future longitudinal designs should incorporate wearable tracking and match analysis for richer contextual insights.

Conclusions

This study provides valuable insights into the influence of indoor football (futsal) on professional footballers in Sri Lanka, revealing a significant association between futsal participation and increased risk of indoor injuries. The predominance of lower limb injuries, particularly to the ankle, hip/groin, and knee, underscores the biomechanical challenges posed by the indoor game's fast pace and confined playing environment. While futsal offers clear benefits in enhancing technical skills and agility, it also presents unique injury risks that warrant attention. Notably, many professional players participate in futsal as a leisure-time activity, often driven by a poor perception of its potential injury risks. This casual engagement without appropriate conditioning or injury prevention awareness may contribute to the elevated injury rates observed. The predominance of overuse injuries and the concentration of injuries during the mid-preseason period further highlight the need for targeted load management and educational strategies. Coaches, medical staff, and players should collaborate to develop structured conditioning and injury prevention programs that address futsal's specific demands while maximizing its developmental benefits. Future research should employ longitudinal methods

and objective exposure tracking to better understand injury mechanisms and long-term career implications. Overall, this study lays a foundation for optimizing training practices and safeguarding the health and performance of professional footballers who engage in indoor football, whether competitively or recreationally.

Competing Interests

The authors have no competing interests to declare

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