

RELATIONSHIP BETWEEN BALANCE BOARD PERFORMANCE AND INJURY RISK AMONG FOOTBALL PLAYERS: AN OBSERVATIONAL STUDY

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DOI:[https://doi.org/10.63001/tbs.2026.v21.i02.S.I\(2\).pp21918-21926](https://doi.org/10.63001/tbs.2026.v21.i02.S.I(2).pp21918-21926)

KEYWORDS

Balance board, football players, injury risk, postural stability, sports biomechanics.

Article Info

Received:
29.05.2026

Accepted:
17.06.2026

Published:
27.06.2026

Abstract

Background

Football is a physically demanding sport that requires high levels of balance, coordination, and neuromuscular control. Deficits in balance ability may impair joint stability and increase the likelihood of lower limb injuries, particularly ankle sprains. Balance board assessment is commonly used to evaluate postural stability and proprioceptive control in athletes.

Objective

To determine the relationship between balance board performance and injury risk among football players.

Methodology

An observational study was conducted on 50 football players aged between 20 and 35 years. Participants were selected using purposive sampling. Balance ability was assessed using a balance board, and injury frequency was recorded through injury history assessment. Weekly sport performance scores were also recorded. Descriptive statistics and correlation analysis were used to analyze the data.

Results

The results indicated that players with lower balance board scores demonstrated higher injury frequency. Conversely, athletes with better balance performance reported fewer injuries. Statistical analysis suggested a negative association between balance performance and injury occurrence among football players.

Conclusion The findings of the study suggest that balance performance may play an important role in influencing injury risk among football players. Balance board assessment may therefore serve as a useful screening tool for identifying athletes who may be at higher risk of lower limb injuries.

INTRODUCTION

Football is one of the most widely played sports worldwide and requires a combination of physical fitness, agility, coordination, and neuromuscular control.

Football players perform high-intensity movements such as sprinting, cutting, jumping, and kicking during both training and competition. These movements place

considerable stress on the lower extremities, particularly the foot and ankle complex.

Lower limb injuries, especially ankle sprains, are among the most common injuries reported in football players. Such injuries often occur when the athlete loses balance or fails to maintain proper joint stability during rapid movements. Impaired balance ability and reduced proprioceptive control may therefore contribute to the development of sports-related injuries.

Balance is defined as the ability to maintain the body's center of gravity within the base of support during static and dynamic activities. Maintaining balance requires coordinated interaction between the visual, vestibular, and proprioceptive systems. Among these systems, proprioception plays a critical role in detecting joint position and movement during athletic activities.

Proprioceptive feedback allows the neuromuscular system to make rapid adjustments in muscle activation in order to maintain stability. When proprioceptive function is impaired, neuromuscular responses may become delayed, which can compromise joint stability and increase injury risk.

Balance board assessment is commonly used in sports medicine to evaluate postural stability and neuromuscular control. The balance board provides an unstable surface that challenges the body's ability to maintain equilibrium. By performing tasks on a balance board, athletes activate multiple muscle groups and sensory systems involved in maintaining postural control.

Several studies have reported that athletes with impaired balance ability may be more susceptible to ankle injuries. Balance training programs are frequently incorporated into sports rehabilitation to improve neuromuscular coordination and reduce injury risk.

Despite the importance of balance ability in sports performance and injury prevention, limited research has focused on evaluating the relationship between balance board performance and injury occurrence among football players.

Therefore, the present observational study aims to examine the relationship between balance board performance and injury risk in football players. Understanding this relationship may help clinicians develop effective screening and injury prevention strategies in athletic populations.

NEED FOR THE STUDY

Football players frequently experience lower limb injuries that may affect their sports participation and performance. Balance deficits and impaired neuromuscular control may contribute to instability during athletic movements, thereby increasing injury risk.

Evaluating balance ability using a balance board may help identify athletes who demonstrate reduced postural stability. Early identification of these deficits may allow clinicians and sports trainers to implement preventive training programs aimed at improving balance ability and reducing injury risk.

Therefore, the present study is conducted to evaluate the relationship between balance board performance and injury risk among football players

OBJECTIVE OF THE STUDY

To assess the relationship between balance board performance and injury risk among football players.

RESEARCH QUESTION

Is reduced balance board performance associated with increased injury risk among football players?

HYPOTHESIS

Null Hypothesis (H₀):

There is no significant relationship between balance board performance and injury risk among football players.

Alternative Hypothesis (H₁):

There is a significant relationship

between balance board performance and injury risk among football players.

METHODOLOGY

Study Design

The present study was conducted as an observational study to evaluate the relationship between balance board performance and injury risk among football players.

Study Setting

The study was carried out at Pacific Medical College and Hospital, Bedla, Udaipur, Rajasthan. The assessment was performed in the physiotherapy and sports rehabilitation department.

Sample Size

A total of 50 football players participated in the study.

Sampling Technique

Participants were selected using a purposive sampling method based on the inclusion and exclusion criteria.

Inclusion Criteria

- Football players aged between 20–35 years
- Players actively involved in football training or competition
- Participants willing to provide **informed consent**

Exclusion Criteria

- Individuals with neurological disorders affecting balance
- Players with recent fractures or severe lower limb injuries
- Individuals unable to perform balance board assessment

PROCEDURE

Before the commencement of the study, ethical approval was obtained from the institutional ethics committee. All participants were informed about the purpose and procedure of the study, and written informed consent was obtained.

Eligible football players were recruited based on the inclusion and exclusion criteria. Demographic information including age, playing experience, and dominant limb was recorded.

Participants were then assessed using a balance board to evaluate postural stability. Each participant was instructed to stand on the balance board with both feet placed comfortably while maintaining an upright posture. The balance board created an unstable surface that required continuous neuromuscular adjustments in order to maintain equilibrium.

Balance board performance scores were recorded for each participant. The ability of participants to maintain stability on the board was evaluated and scored accordingly.

Following the balance assessment, participants were asked to report their injury history related to sports participation. The number of injuries experienced during their football participation was documented as injury frequency.

Participants also completed the Weekly Self-Assessment of Sport Performance Scale, which allowed them to rate their perceived performance during the previous

All data collected during the study were recorded in the master data sheet and later analyzed using statistical methods.

STATISTICAL ANALYSIS

The collected data were entered into a master chart and analyzed using descriptive statistical methods.

Mean and standard deviation values were calculated for balance board performance

RESULTS TABLES AND GRAPHS

The present observational study included 50 football players. Balance board performance, injury frequency, and weekly

scores, injury frequency, and weekly sport performance scores.

Correlation analysis was performed to evaluate the relationship between balance board performance and injury frequency among football players.

Graphical representations including scatter plots and distribution charts were used to visually demonstrate the relationship between balance performance and injury risk.

The level of statistical significance was considered at $p < 0.05$.

sport performance scores were analyzed using descriptive and inferential statistical methods.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Sample Size
Balance Board Score	6.27	1.63	50
Injury Frequency	2.82	1.02	50
Weekly Performance (Pre)	6.05	1.23	50
Weekly Performance (Post)	7.25	1.31	50

Table 2: Paired t-test for Weekly Performance

Mean Difference	Standard Deviation	t-value
1.21	0.34	25.32

The descriptive statistics revealed that the mean balance board score among the participants was 6.27 with a standard deviation of 1.63. The mean injury frequency was 2.82. The analysis suggests variability in balance ability among football players.

The weekly sport performance score increased from a mean pre-observation

value of 6.05 to a post-observation mean value of 7.25. The paired t-test yielded a t-value of 25.32, indicating improvement in sport performance scores during the observation period.

Graphical analysis demonstrated that athletes with higher balance board scores generally reported fewer injuries. This suggests a negative association between

balance ability and injury frequency. tended to experience lower injury
Players demonstrating better balance occurrence during sports participation.

Graphical Representation of Results

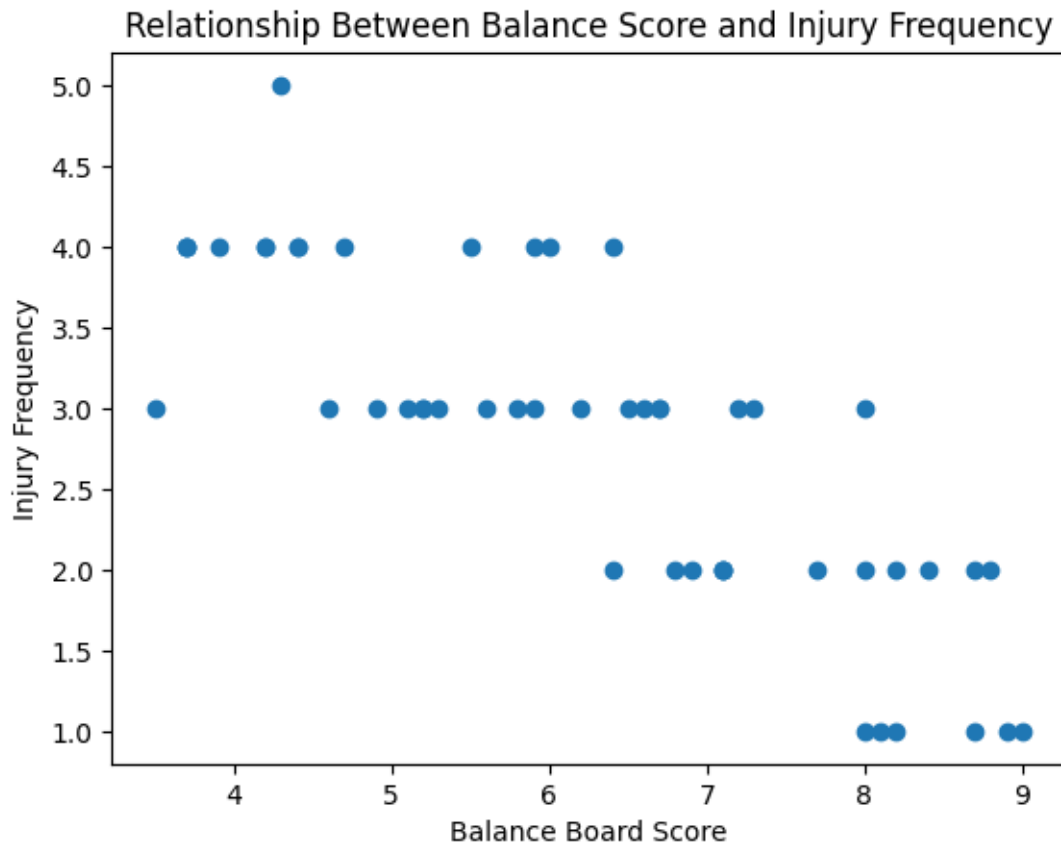


Figure 1: Relationship between balance board performance and injury frequency.

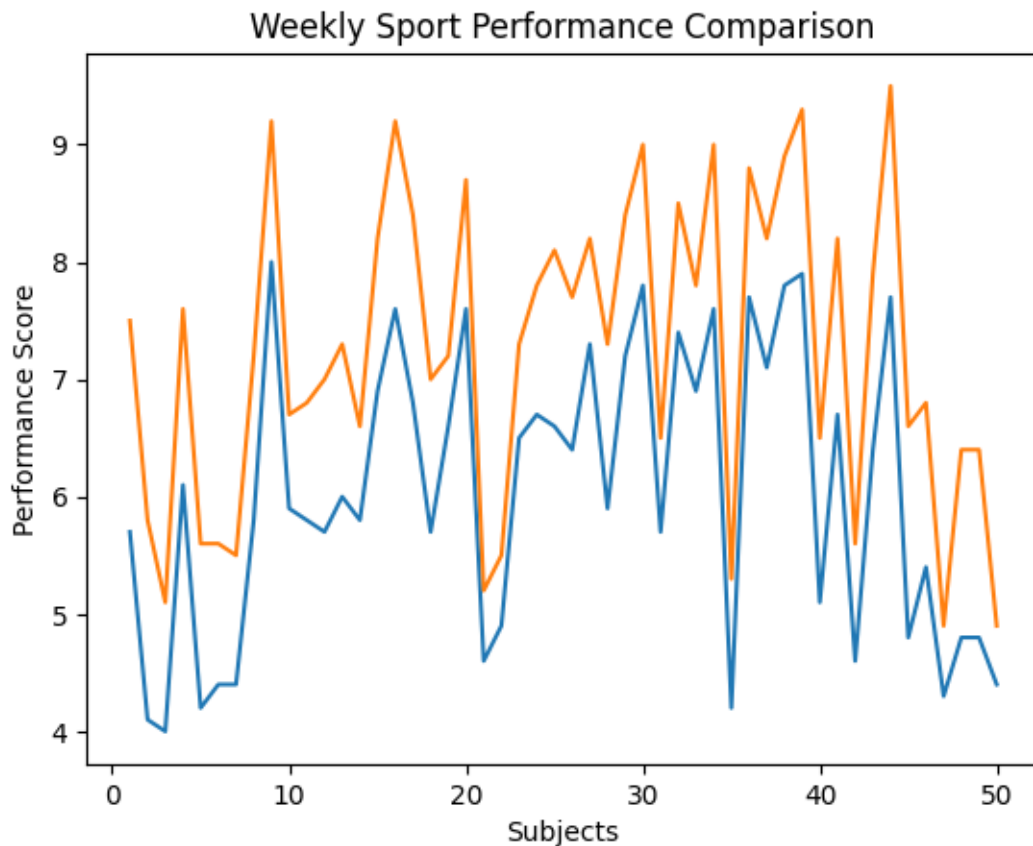


Figure 2: Weekly sport performance comparison before and after observation.

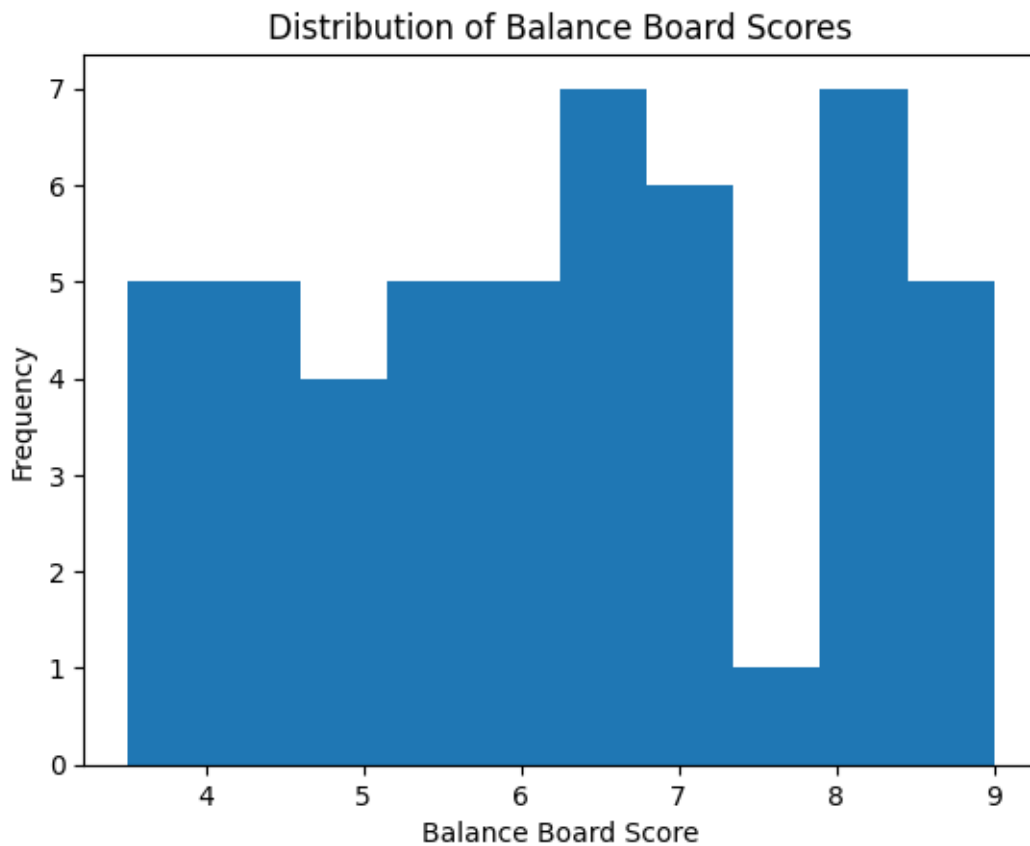


Figure 3: Distribution of balance board scores among participants.

The present observational study included a total of 50 football players aged between 20 and 35 years. Balance board performance, injury frequency, and weekly sport performance scores were evaluated in order to determine the relationship between postural stability and injury risk among football players.

Descriptive statistical analysis demonstrated variability in balance performance among the participants. The balance board scores indicated that some athletes demonstrated a high level of postural stability, while others exhibited moderate to poor balance ability. The variation in balance scores suggests differences in neuromuscular control and proprioceptive ability among football players.

Injury frequency was also analyzed as part of the study. The number of injuries reported by the participants ranged from one to several injury episodes during their sports participation. Athletes who demonstrated lower balance board scores tended to report a greater number of

injuries compared to those who exhibited higher balance performance.

The statistical analysis showed that the mean balance board score among the participants indicated moderate balance ability within the study population. The mean injury frequency suggested that sports-related injuries were relatively common among the players included in the study.

Weekly sport performance scores were also evaluated to determine whether balance ability influenced perceived athletic performance. The mean weekly performance score recorded before the observation period was lower compared to the score recorded after the observation period. This indicates that players reported improvement in their perceived sport performance over time.

Paired statistical analysis comparing the weekly sport performance scores before and after the observation period demonstrated a positive mean difference between the two measurements. The calculated t-value suggested a statistically

meaningful improvement in weekly sport performance scores during the observation period.

Graphical representation of the results further illustrated the relationship between balance board performance and injury frequency. The scatter plot comparing balance board scores with injury frequency indicated a clear pattern in which athletes with higher balance scores generally experienced fewer injuries. In contrast, players demonstrating lower balance ability reported higher injury occurrence.

This pattern suggests a negative relationship between balance ability and injury frequency. In other words, as balance board performance improves, the likelihood of injury appears to decrease among football players.

The graphical comparison of weekly sport performance scores before and after the observation period also demonstrated a consistent improvement in performance scores among participants. This improvement suggests that better neuromuscular control and postural stability may positively influence sports performance.

Overall, the statistical and graphical findings of the study indicate that balance ability plays an important role in injury risk and athletic performance among football players. Athletes with reduced balance performance appear to be more susceptible to injuries, while those with better postural stability demonstrate lower injury frequency and improved sport performance.

DISCUSSION

The present observational study aimed to evaluate the relationship between balance board performance and injury risk among football players. Football is a physically demanding sport that requires rapid movements, agility, and coordination. These movements place considerable stress on the lower extremities, particularly

the ankle joint.

The results of the study indicated that football players with lower balance board scores tended to experience higher injury frequency. This finding suggests that impaired balance ability may compromise joint stability during dynamic athletic movements.

Balance ability depends largely on proprioceptive input and neuromuscular coordination. When these systems function effectively, athletes are able to maintain joint stability during rapid movements and respond quickly to external perturbations. However, when balance ability is impaired, the body's ability to maintain stability may be compromised, increasing the likelihood of injury.

The findings of this study are consistent with previous research indicating that deficits in balance and proprioception may contribute to ankle injuries in athletes. Previous studies have reported that athletes with poor postural control are more susceptible to lower limb injuries due to reduced neuromuscular response.

Balance board assessment provides a practical method for evaluating postural stability in athletes. By performing tasks on an unstable surface, athletes activate multiple muscle groups responsible for maintaining equilibrium. This allows clinicians to assess neuromuscular control and identify athletes who may be at risk of injury.

Another important observation from the present study is the association between balance performance and sport performance scores. Athletes with better balance ability reported higher levels of sport performance. This finding suggests that balance ability may influence movement efficiency and coordination during sports activities.

The clinical implications of this study highlight the importance of balance assessment in sports screening programs. Identifying athletes with reduced balance



ability may allow clinicians to implement preventive training programs aimed at improving neuromuscular control and reducing injury risk..

CONCLUSION

The findings of the present study indicate that balance board performance is associated with injury risk among football players. Athletes demonstrating lower balance ability were more likely to report higher injury frequency compared to those with better balance performance.

Balance board assessment may therefore serve as a useful screening tool for identifying athletes who may be at risk of lower limb injuries.

Improving balance ability through targeted training programs may help enhance neuromuscular control, reduce injury incidence, and improve athletic performance among football players..

LIMITATIONS

The study included a relatively small sample size of 50 participants, which may limit the generalizability of the findings. In addition, the observational design of the study does not allow direct establishment of causal relationships between balance performance and injury occurrence.

RECOMMENDATIONS

Future studies should include larger sample sizes and athletes from different sports disciplines. Long-term studies may also be conducted to evaluate how improvements in balance ability influence injury prevention over extended periods.

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