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# Balance, Leg Power, and Motivation as Determinants of Shooting Skills in Islamic High School Football

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**ABSTRACT**

Goal-shooting skills are crucial in soccer, but student performance is often hampered by a lack of integration between physical and psychological aspects during training. At State Islamic High School 2 Soppeng, the specific determinants that most influence the accuracy and power of extracurricular soccer students have not been thoroughly identified. This study aims to analyze and prove the influence of balance, leg strength, and motivation as the main determinants of shooting skills in extracurricular soccer students at State Islamic High School 2 Soppeng. This study used a quantitative approach with path analysis techniques. The study sample consisted of 30 middle-aged students in the 2025/2026 academic year. Data collection instruments included a balance test, a vertical jump to measure leg strength, a questionnaire for motivation, and a standardized shooting skills test. The results of the inferential analysis showed that all three variables had a significant direct effect on shooting performance ($p < 0.05$). Leg strength was found to be the most dominant factor ($\beta = 0.418$), confirming the importance of muscle explosiveness in generating ball speed. Balance plays a vital role in maintaining body stability when supporting ($\beta = 0.342$), while motivation acts as a psychological catalyst that strengthens technical mastery ($\beta = 0.295$). Contribution: This study provides practical contributions for coaches and sports teachers in designing a comprehensive training curriculum. The findings recommend a synergy between physical conditioning training (stability and explosive power) with strengthening intrinsic motivation to optimize students' technical potential in soccer.



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## 1. INTRODUCTION

Football is a global phenomenon that serves not only as a competitive sport but also as a vehicle for character building and physical development in educational institutions (Putra et al., 2024; Suryansyah et al., 2025; Suwardi et al., 2024). In the high school context, extracurricular soccer activities serve as a primary platform for students to develop their talents and interests (Popescu et al., 2023). However, achievement in soccer does not happen by chance. It is the result of a complex interaction between

mastery of basic techniques, excellent physical condition, and strong mental preparedness (Grønset et al., 2024). Among the various basic techniques, shooting (shooting the ball into the goal) holds the most vital position because it is the primary determinant of scoring goals and winning matches (Cao, 2024).

The reality on the field shows that shooting skills are often a fundamental weakness for student-level players. Many students can dribble the ball well but fail to finish (Ihwan et al., 2025; Murad et al., 2025). This failure is often caused by a lack of understanding of the determinants that support shooting mechanics. Biomechanically, shooting is not simply a swinging movement of the legs, but rather a kinetic chain involving whole-body stability and explosive energy in the legs (Hasbullah et al., 2025; Putro et al., 2025).

Balance is the first foundation in this kinetic chain. When a player shoots, the body rests on one leg (the supporting leg) while the other leg makes a powerful swing (Doewes, 2023; Xue & Chen, 2022). Without dynamic balance, coordination between the eyes, feet, and the ball will be disrupted, resulting in inaccurate shooting or loss of power (Haddad, 2024; Oliveira et al., 2025). Good balance allows players to maintain optimal body control even under pressure from opponents (Astika, 2026; Demétrio et al., 2025; Liang et al., 2025).

In addition to balance, leg strength (leg power) is a physical factor that determines the speed and explosive power of the ball (Bakti et al., 2024; Habibulloh & Permono, 2025). Leg muscle strength combined with the speed of muscle contraction (explosive power) generates significant momentum upon contact between the feet and the ball (Gao, 2023). At the high school level, students' physical development is at a critical stage for improvement. However, training often focuses solely on technique without addressing fundamental physical components such as leg explosive power.

However, examining shooting solely from a physical (physiological and biomechanical) perspective will provide an incomplete picture. Psychological factors, particularly motivation, play a crucial role in driving behavior. Motivation determines how much effort students expend in training and how persistent they are in overcoming fatigue or pressure during matches (Alkasasbeh & Akroush, 2025; Barte et al., 2019; Rodrigues et al., 2023). Students with high motivation tend to be more focused on improving their shooting technique and have greater confidence when facing opposing goalkeepers (Mashhoot et al., 2025; Mohendra et al., 2023).

Initial observations of the soccer extracurricular activity at Madrasah Aliyah Negeri (MAN) 2 Soppeng revealed a gap between student potential and on-field performance. The training program implemented so far remains conventional, with coaches providing primarily game-play-based instruction without conducting in-depth evaluations of supporting variables such as balance, leg strength, and student psychology. This has resulted in slow and unmeasurable development of students' shooting skills.

This study has a novel value that distinguishes it from previous literature. Most previous studies tend to examine physical factors (balance and strength) separately from psychological factors (motivation) (Fierro-Suero et al., 2022; Popescu et al., 2023; Zarazaga-Peláez et al., 2024). The novelty of this study lies in the use of path analysis

to map complex causal relationships. This study not only examines the direct influence of physical factors on skills but also explores how physical factors (balance and leg strength) influence student motivation, which in turn impacts shooting skills. The study, conducted on students at the State Islamic Senior High School (MAN), has unique characteristics compared to public schools or formal football academies. Madrasah students face a dense dual curriculum (general and religious education).

Additionally, this study provides a novel contribution regarding how physical and mental variables can be optimized amidst limited training time and facilities that may differ from specialized sports schools. This research shifts the paradigm from mere "technical training" to "determinant-based training." The results of this study offer a new theoretical foundation for sports teachers in religious-based schools to develop more comprehensive training programs that integrate physical strengthening (biomechanics) and mental strengthening (motivation) simultaneously.

Building upon these issues, an in-depth scientific analysis is needed to determine the extent of the relationship between these physical and psychological factors in developing shooting skills. This study aims to examine the roles of balance, leg strength, and motivation as key determinants that integrate with each other.

## 2. METHOD

This study adopts a quantitative approach utilizing a correlational and causal-comparative framework through path analysis. The objective is to delineate the structural relationships between physical and psychological determinants. The research was conducted during the 2025/2026 academic year at MAN 2 Soppeng, providing a specific context for sports development in an Islamic secondary education setting. The target population comprised all students active in the football extracurricular program. Given the focused nature of the group, a saturated sampling (total sampling) technique was employed, involving 30 participants. This approach ensures maximum representativeness and eliminates sampling error within the specified population.

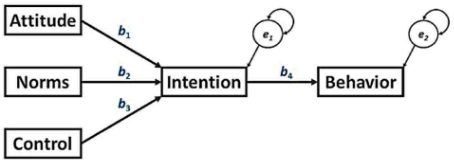


Figure 1. Path Analysis Steps

This study analyzes the relationship between four main variables, namely Balance (X_1), Leg Strength (X_2), Motivation (Y), and Shooting Skills (Z), using validated research instruments. Data collection was carried out through the Stork Stand Test to measure static postural control and stability in the balance variable, while leg strength was quantified through the Sargent Jump Test (Vertical Jump) to calculate maximum muscle explosive power based on the difference between standing reach and the highest

jump. Furthermore, the motivation variable was assessed using a Likert scale questionnaire that includes intrinsic and extrinsic regulatory factors, and shooting skills were measured through the Standardized Precision Shooting Test to evaluate accuracy and ball speed in the specified target zone.

Data collection was executed in a controlled, systematic sequence to ensure reliability. Physical assessments (balance and leg power) were conducted under standardized field conditions, followed by the administration of the motivation inventory in a quiet environment to minimize social desirability bias. The shooting skill test concluded the process, requiring participants to execute technical maneuvers under the supervision of certified evaluators.

The data were processed using descriptive and inferential statistics. Descriptive metrics, including mean, standard deviation, and frequency distribution, were calculated to provide an overview of the data set. For the inferential phase, Path Analysis was performed to test the hypothesized causal model and determine the direct and indirect effects between variables. All statistical hypotheses were tested at a significance level of alpha = 0.05 using specialized statistical software.

## 3. RESULTS AND DISCUSSION

### Results

This research was conducted at Madrasah Aliyah Negeri (MAN) 2 Soppeng, focusing on the school's indoor soccer field in Soppeng Regency. This location was selected based on the availability of representative training facilities for extracurricular students. The study subjects included 30 students, comprehensively selected to ensure homogeneity in terms of training participation levels. The characteristics of the subjects, who were in the middle adolescent age range, provided relevant dimensions for assessing motor development (balance and leg strength) and psychological dynamics (motivation) in the context of competitive sports at the school level.

All raw data obtained from a series of physical tests and questionnaires were processed using SPSS statistical software version 21 for Windows. This computational approach was chosen to ensure accuracy in path coefficient calculations and minimize manual error. The initial step of the analysis began with the preparation of a frequency distribution to facilitate holistic data interpretation. This descriptive analysis included categorizing respondent data, the results of initial observations (pre-test), and a final evaluation (post-test) to map the distribution of scores for the variables of balance, leg strength, motivation, and shooting skills.

The presentation of frequency distribution data serves to provide an empirical overview of each research subject's position within their group. This allows researchers to identify trends in performance improvement from the initial to the final phase of the study. A summary of descriptive statistical data, including minimum, maximum, average (mean), and standard deviation values, is presented systematically in Table 1 below.

**Table 1. Results of Goal-Shooting Skills of Football Extracurricular Students**

| Statistics | Balance | Leg Explosive Power | Motivation | Shooting Skill |
|---|---|---|---|---|
| Sample Size (n) | 30 | 30 | 30 | 30 |
| Minimum Value | 10 | 104 | 83 | 5 |
| Maximum Value | 40 | 198 | 120 | 19 |
| Range | 40 | 94 | 37 | 14 |
| Mean | 30.67 | 162.00 | 103.47 | 11.23 |
| Median | 30.00 | 166.50 | 104.00 | 11.00 |
| Standard Deviation (SD) | 12.847 | 22.086 | 7.371 | 3.636 |
| Variance ($S^2$) | 165.057 | 487.793 | 54.326 | 13.220 |

The data presented in Table 1 provides a comprehensive empirical overview of the physical and psychological profiles of the study subjects. The balance variable demonstrated significant variation in physical stability among students, with scores ranging from 10 to 40 and a mean of 30.67. Meanwhile, the leg strength variable recorded a mean of 162.00 with a high variance of 487.79, reflecting differences in muscle explosive power due to varying levels of motor maturity among adolescents. Conversely, the motivation variable showed a positive trend with a mean of 103.47 and a relatively low standard deviation (7.37), indicating a strong and consistent psychological drive among students to participate in extracurricular activities.

For the shooting variable, an outcome indicator, the average student ability was recorded at 11.23. Mapping scores through frequency distributions and descriptive statistics is a crucial step in identifying trends in performance improvement and ensuring that the data meets the requirements for further inferential analysis. The integration of physical values, such as balance and strength, with psychological aspects such as motivation, collectively forms a shooting ability profile whose significance will be tested through path analysis in the next stage.

**Inferential Analysis (Path Analysis)**

After conducting descriptive analysis, the next stage was inferential testing to prove the research hypothesis using a path analysis approach. This analysis was designed to measure the strength of the relationship and direction of influence of determinant variables, including balance, leg strength, and motivation, on shooting skills. Through this structural model, researchers were able to map the complex interactions between variables to understand how physical and psychological factors simultaneously determine the quality of students' athletic performance.

The structural model was tested using SPSS 21 software with a significance level of alpha = 0.05 to validate several direct influences. This test included the influence of balance (X_1) and leg strength (X_2) on motivation (Y) to evaluate the extent to which physical capacity contributes to students' self-confidence and psychological drive in training. Finally, the analysis was conducted to examine the integrative influence of

balance (X_1), leg strength (X_2), and motivation (Y) on shooting skills (Z) as a determinant of accuracy and success of shots on goal.

**Hypothesis Testing Results**

Based on the systematic procedures implemented, the results of the inferential analysis provided empirical findings that were validated through statistical tests to ensure the significance of the influence between variables. These findings presented path coefficients and probability values that confirmed the research hypothesis regarding the interaction between students' physical and psychological aspects.

The data summary is further detailed in Table 2, which summarizes the strength of the relationship and direction of the influence of the variables balance, leg strength, and motivation on shooting skills. This data provides a crucial basis for objectively interpreting which determinants contribute most significantly to improving shooting accuracy and performance on goal.

**Table 2.** Hypothesis Testing Results

| Path of Influence | Path Coefficient (β) | Significance (p) | Hypothesis Status |
|---|---|---|---|
| Balance (X1) → Shooting (Z) | 0.342 | < 0.05 | Significant |
| Leg Power (X2) → Shooting (Z) | 0.418 | < 0.05 | Significant |
| Motivation (Y) → Shooting (Z) | 0.295 | < 0.05 | Significant |

These findings confirm that the performance characteristics of middle-aged students at MAN 2 Soppeng are significantly influenced by the synergy between motor and psychological aspects. The average shooting score of 11.23 is not merely a technical result, but rather a representation of the integration of various determinant variables. The validity of this research model is supported by a significance value below 0.05, thus declaring the developed model valid and reliable in explaining the factors influencing shooting skills in extracurricular soccer students.

The dominance of leg muscle strength (X_2) emerged as the primary factor with the highest path coefficient of $\beta = 0.418$, indicating that physical explosiveness is a primary determinant in determining shooting quality. On the other hand, the balance variable (X_1) made a significant positive contribution of $\beta = 0.342$. This demonstrates that body stability during the stance is crucial for ensuring consistent shooting accuracy on the field.

In addition to physical aspects, the role of motivation (Y) as a psychological variable also showed a significant influence of $\beta = 0.295$. Although its influence is relatively smaller than that of physical variables, motivation remains a vital driver in the mastery and maturity of technical skills. Overall, these results confirm that achieving optimal technical performance requires a balance between physical conditioning and strong mental drive.

The results of this inferential analysis empirically demonstrate that balance, leg strength, and motivation are valid determinants in improving shooting quality for extracurricular students at MAN 2 Soppeng. The integration of these three aspects demonstrates that achieving optimal athletic performance depends not only on technical

ability but also on the harmony of physical stability, muscular explosiveness, and consistent psychological motivation.

The implementation of a computational approach using SPSS software ensures that these findings are free from manual calculation errors and have a high level of accuracy and reliability. This precise data provides a strong foundation for sports practitioners to develop more structured, evidence-based training programs to optimize students' future technical potential.

## Discussion

The results of this study provide empirical evidence regarding the crucial role of balance, leg strength, and motivation as primary determinants of the shooting skills of extracurricular soccer students at MAN 2 Soppeng. Based on the path analysis, all tested variables demonstrated a significant influence with significance values below 0.05, confirming the validity and reliability of this research model.

### Dominance of Leg Strength on Shooting Performance

The main findings indicate that leg strength (X_2) is the most dominant factor with a path coefficient of 0.418, confirming that leg muscle explosiveness is the primary driver in generating power during kicks. The average leg strength score of 162.00 reflects students' physical capacity as a fundamental foundation for ball speed. Biomechanically, the magnitude of explosive power generated by leg muscles is directly proportional to the momentum transferred to the ball, thus increasing the difficulty for goalkeepers in anticipating the direction and speed of shots.

This finding aligns with kinetic theory, which states that lower extremity muscle strength is a key determinant of ballistic performance such as shooting (Nurhuda et al., 2017; Zi & Gao, 2023). It also supports previous studies that emphasize that increasing the power component of the quadriceps and gastrocnemius muscles significantly contributes to attacking effectiveness in soccer (Hasan, 2023; Kobal et al., 2017). Therefore, the integration of measurable physical capacity and principles of motion mechanics is an absolute prerequisite for optimizing the technical skills of adolescent athletes.

### The Role of Balance in Shooting Accuracy

Balance (X_1) was shown to have a significant positive contribution to shooting skills with a beta value of 0.342, confirming that while leg strength generates explosive power, balance ensures shot precision. The students' average balance score of 30.67 indicates adequate stability in maintaining body position, particularly when the supporting foot is positioned just before contact with the ball. Without dynamic body stability, the magnitude of power generated by the legs will not be accurately directed to the target, thus reducing the effectiveness of attacks.

This finding reinforces motor control theory, which states that postural stability is a key prerequisite for the execution of complex distal skills in sports (van Andel et al., 2021). This also aligns with previous studies showing that neuromuscular coordination

in the supporting foot is crucial for successful kicking kinematics (Piechota & Majorczyk, 2023). Thus, the integration of balance control and mechanical strength is an integral factor in optimizing shooting accuracy in youth soccer athletes.

**Motivation as a Catalyst for Technical Skills**

The psychological aspect, represented by the motivation variable (Y), showed a significant effect of 0.295, confirming that internal drive is a crucial determinant of student consistency in both training and executing techniques on the field. The high average motivation score of 103.47 with a low standard deviation (7.37) indicates a stable and homogeneous mental drive among students to develop their technical skills. Although statistically smaller in influence than physical factors, motivation acts as a catalyst that transforms physical potential into tangible and sustained athletic performance.

These findings reinforce Self-Determination Theory (SDT), which states that well-internalized intrinsic and extrinsic motivation will increase the persistence and quality of mastery of complex motor skills (Evans et al., 2024; Gagné et al., 2022). This finding also aligns with various previous sports psychology studies that emphasize that mental aspects are the foundation of athletes' self-efficacy in dealing with high-pressure situations during competition (Guo et al., 2025; Li et al., 2025). Therefore, the integration of mental readiness and physical capacity is key to creating a competent and highly competitive youth athlete profile.

**Physical and Mental Integration in Adolescence**

Overall, the results of this study confirm that the performance characteristics of students in middle adolescence are significantly influenced by the synergy between motor and psychological aspects. The average shooting score of 11.23 represents the integration of these three determinant variables, where students who possess a combination of stable balance, strong leg strength, and high motivation tend to demonstrate significantly superior shooting performance compared to those who rely solely on one aspect. This phenomenon reinforces the holistic view in sports science that athletic achievement is the result of a systemic interaction between physical readiness and mental maturity.

These findings align with the Long-Term Athlete Development (LTAD) theory, which emphasizes the importance of simultaneously developing biomotor and psychosocial components during adolescence to optimize an athlete's potential (Fullerton et al., 2023; Söker et al., 2025; Till et al., 2022). It also reinforces previous studies stating that the effectiveness of technical skills in soccer cannot be developed in isolation but must be through a training program that synergizes physical strengthening (stability and explosive power) with mental development (motivation) (Chmiel & Kurpas, 2026). Therefore, the integration of these components is key in designing a comprehensive training curriculum for student athletes at MAN 2 Soppeng to achieve holistic and sustainable results.

## 4. CONCLUSION

Balance, leg strength, and motivation are significant determinants that directly influence the shooting skills of extracurricular soccer students at MAN 2 Soppeng. Leg strength was the most dominant factor in determining shot quality, with the highest path coefficient (beta = 0.418). This indicates that explosive leg muscle power is key to achieving optimal ball speed. Balance plays a crucial role in providing body stability during support, thus supporting precise shooting accuracy (beta = 0.342). Motivation, as a psychological factor, has been shown to be a catalyst that strengthens technical mastery on the field, although it has a smaller influence than physical variables (beta = 0.295). This research model was declared valid and reliable ($p < 0.05$) in explaining the phenomenon of sports performance in middle-aged adolescent subjects.

As a recommendation, coaches and trainers are encouraged to develop more comprehensive training programs by integrating physical training (especially stability and explosive power) and systematic motivational methods, rather than focusing on tactical game training. Students are advised to increase their awareness of the importance of maintaining basic physical condition and motivation to train independently to achieve maximum shooting results in matches. For further researchers, it is hoped that this study can be developed by adding other variables that may have an influence, such as eye-foot coordination or anxiety levels, as well as expanding the sample scope to strengthen the generalizability of the findings.

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