

Description of Women's Futsal reviewed from: Motivation, Exercise, Feedback, Physiology

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Abstract

This study aims to identify the levels of intrinsic motivation and self-development, achievement motivation, social and competitive support, perceptions of training and coach feedback, and the physiological and physical conditions of female futsal athletes, and analyze the differences based on demographic characteristics. The study used a quantitative approach with a cross-sectional survey design. Respondents were 254 female futsal athletes selected through purposive and snowball sampling. The instrument was a 20-item closed-ended questionnaire with a 4-point Likert scale that had been tested for validity ($r = 0.491-0.844$; $r\text{-table} = 0.3494$) and reliability (Cronbach's $\alpha = 0.904$). Data were analyzed using descriptive statistics, Pearson correlation, and MANOVA with the help of IBM SPSS Statistics 27. The results showed that the majority of respondents were in the high category: intrinsic motivation and self-development 87.0% ($M = 21.43$; $SD = 2.852$), achievement motivation, social support, and competitive 88.6% ($M = 21.41$; $SD = 2.701$), training and coach feedback 87.4% ($M = 17.82$; $SD = 2.224$), and physiological and physical conditions 87.4% ($M = 10.01$; $SD = 1.715$). A significant positive correlation was found between the variables ($r = 0.356-0.678$; $p < 0.01$). There were significant differences based on competition level (Wilks' $\Lambda = 0.876$; $F(12, 654) = 2.34$; $p = 0.006$; $\eta^2 = 0.043$) and training experience (Wilks' $\Lambda = 0.891$; $F(12, 654) = 2.12$; $p = 0.014$; $\eta^2 = 0.038$), although the effect size was small to medium. It can be concluded that female futsal athletes have motivation, perception of training and feedback, and physiological conditions that support achievement. This finding emphasizes the importance of holistic coaching that integrates psychological, training environment, and physiological aspects. Future research is recommended to use longitudinal designs and objective measurements to strengthen these findings.

Keywords: Women's futsal; motivation; coach feedback; physiological; survey.

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Introduction

Futsal is a sport experiencing rapid growth worldwide, including in the women's category (Barreira et al., 2024; Mendes et al., 2022). The popularity of women's futsal continues to increase along with the increasing participation of women across various age groups, from children to adults (Barreira et al., 2025; Widiyono, 2022). This increase is reflected in the increasing number of schools, communities, and professional clubs that are opening access for women to participate in the sport (Ramadhan et al., 2025). However, behind this development, female futsal athletes still face various problems related to motivation, psychological conditions, training quality, and physiological conditions (Barreira et al., 2024; Fortaleza et al., 2023).

Gender inequality remains evident in limited access to facilities, training programs, achievement recognition, and economic opportunities (Barreira et al., 2024; Baldessar et al., 2023; Santos et al., 2024). Female athletes also often receive lower wages and struggle to secure sponsorship, even in popular sports like soccer and futsal (Barreira et al., 2025; Sanmiguel-Rodríguez, 2021). These conditions have the potential to reduce female athletes' motivation, self-confidence, and psychological well-being during training and matches (Mulyani & Setiawan, 2025; Widodo et al., 2022). Motivation is a psychological factor that plays a crucial role in the continued participation of female futsal athletes.

Intrinsic motivation, achievement motivation, social support, and a competitive climate have been shown to influence athletes' engagement in training and competition (Grova et al., 2023). High self-confidence contributes to increased achievement motivation and decision-making quality in futsal (Djaba et al., 2024; Rico-Lara et al., 2023). Support from peers, parents, and teammates has also been shown to increase athletes' motivation to achieve performance targets (Hamzah et al., 2024; Perangin-angin & Indriana, 2021). A conducive environment can improve athletes' performance consistency, while strong intrinsic motivation encourages athletes to continue learning and improving their futsal skills (Akbar & Khory, 2023; Silva & Tonial, 2025).

However, there is little research specifically examining how the combination of intrinsic motivation, achievement motivation, social support, and competitive climate interact in the context of women's futsal in Indonesia (Barreira et al., 2024). In addition to motivational aspects, the quality of training and coach feedback are also crucial factors in the development of female futsal athletes. Structured and systematic training programs have been shown to improve physical adaptation and mastery of basic techniques in women's futsal (Marques et al., 2026). Training methods such as small-sided games, agility training, and endurance training have been shown to be effective in improving technical accuracy and athlete performance (Hidayah et al., 2024; Wenly et al., 2021).

Positive interactions between athletes and coaches, including providing appropriate and consistent feedback, are effective in improving women's futsal skills (Jebur et al., 2025; Murtono et al., 2023). Feedback can come from both coaches and teammates and plays a crucial role in helping athletes understand movement errors, improve technique, and maintain performance toward training goals (Corbett et al., 2024; Kolar et al., 2024; Wang et al., 2025). The use of technology such as video analysis and GPS can also improve the objectivity of

feedback (Aydın et al., 2025; Gomes et al., 2024; Kustiawan et al., 2025). However, there is still a gap in research examining women's futsal athletes' perceptions of training quality and coach feedback, particularly in Indonesia (Carson et al., 2025).

Physiological aspects also require special attention in the development of female futsal athletes. The physiological condition of female athletes is influenced by body composition, somatotype, and the menstrual cycle, which can affect physical capacity at each phase (Barreira et al., 2025; Elorduy-Terrado et al., 2025; Hamed-Hamed et al., 2024). Female futsal athletes are generally dominated by the meso-ectomorph somatotype, which reflects a balance between muscle mass and movement efficiency (Campos & Maynard, 2025; Weber et al., 2024). Optimal body composition, such as low fat mass and high muscle mass, has been shown to support optimal performance (Durmic et al., 2020; Maciejczyk et al., 2022).

The menstrual cycle also influences training readiness and performance through fluctuations in the hormones estrogen and progesterone (Milella et al., 2024; Nexha et al., 2024). During the premenstrual and menstrual phases, athletes often experience increased fatigue, pain, and decreased training quality (Oester et al., 2024). Therefore, periodizing training that takes the menstrual cycle into account is crucial for maintaining stable performance (Bruinvels et al., 2022; Schlie et al., 2025). However, research simultaneously examining the physiological conditions, motivation, and coach feedback of female futsal athletes is still limited (Ramírez-Munera et al., 2025).

Based on initial observations conducted at several women's futsal clubs in West Kalimantan, it was found that although athletes' enthusiasm for training was quite high, there were still issues related to consistent motivation, limited structured coach feedback, and a lack of attention to athletes' physiological conditions, particularly those related to the menstrual cycle. This observation aligns with findings (Barreira et al., 2024) which state that research on women's futsal is still dominated by technical and tactical aspects, while psychological and physiological aspects remain underexplored.

Furthermore, most previous research has been conducted in European and South American countries, leaving the Indonesian context, with its distinct socio-cultural characteristics, largely unexplored (Sanmiguel-Rodríguez, 2021; Santos et al., 2024). This gap underscores the need for research that comprehensively examines the motivation, training, and feedback, as well as the physiological conditions of female futsal athletes in Indonesia. The solution proposed in this study is to conduct a comprehensive survey to identify levels of intrinsic motivation and self-development, achievement motivation, social and competitive support, perceptions of training and coach feedback, and the physiological and physical conditions of female futsal athletes.

Problem solving is carried out through descriptive and inferential analysis, which can provide an objective picture of the athlete's actual condition, thus providing a basis for coaches, club administrators, and stakeholders in designing a more holistic development program. This research also contributes to the development of literature on women's futsal in Indonesia, which has been limited (Barreira et al., 2025). Theoretically, this research is based on the Self-Determination Theory (SDT) proposed by Deci and Ryan, which explains that intrinsic and extrinsic motivation are influenced by the fulfillment of basic psychological needs, namely autonomy, competence, and relatedness (Ryan & Deci, 2022).

In the context of women's futsal, intrinsic motivation and self-development can be understood as fulfilling the needs for competence and autonomy, while social support and coach feedback reflect the fulfillment of relatedness needs. Furthermore, Bandura's Social Cognitive Theory emphasizes the importance of environmental and cognitive factors in shaping behavior, including how feedback and social support influence athletes' self-efficacy and motivation (Bandura, 2023). Thus, this study not only describes the phenomenon but also links it to an established theoretical framework.

The operational definition of the variables in this study is intrinsic motivation and self-development is the athlete's internal drive to improve skills and develop themselves in futsal; achievement motivation, social support, and competitiveness is the drive to achieve achievements influenced by support from the social environment and competitive climate; training and coach feedback is the athlete's perception of the quality of the training program and feedback provided by the coach and teammates; Physiological and physical conditions are the athlete's physical state that supports participation in training and matches, including body composition, fitness, and physical readiness. These four variables were measured using a closed questionnaire with a 4-point Likert scale.

The objectives of this study were to identify the levels of intrinsic motivation and self-development, achievement motivation, social and competitive support, perceptions of training and coach feedback, and the physiological and physical conditions of female futsal athletes; to analyze the differences in these variables based on demographic characteristics (age, competition level, training experience); and to provide practical recommendations for coaches, club administrators, and stakeholders in designing more holistic coaching programs. Therefore, this study is expected to provide theoretical and practical contributions to the development of women's futsal in Indonesia.

Methods

This study used a quantitative approach with a cross-sectional survey design. This design was chosen to systematically collect data from a large number of respondents in a relatively short time, as well as to describe the motivational factors, coach feedback, and physiological conditions of female futsal athletes at a specific point in time (Creswell & Creswell, 2023; Barreira et al., 2024). Respondents in this study were 254 female futsal athletes who actively participated in regular training. Inclusion criteria included females aged 15-30 years; actively participating in futsal training at least twice per week for at least the past 6 months; registered as members of a club, community, or school/university team; and willing to complete the questionnaire without coercion. Exclusion criteria included having an acute injury that hindered training; and not completing all questionnaire items.

The demographic characteristics of the respondents are presented in Table 1. Most respondents were in the 16-20 years age range (58.3%), with a mean age of 18.7 years ($SD = 2.4$). Based on competition level, 42.1% competed at the district/city level, 33.5% at the provincial level, 15.7% at the national level, and 8.7% at the local club level. The average training experience was 2.8 years ($SD = 1.3$), with a range of 0.5-8 years. Respondents came from five provinces in Indonesia (West Kalimantan, West Java, Central Java, East Java, and Central Sulawesi), with the majority coming from West Kalimantan (61.4%). The most

common club affiliation was with local/community clubs (54.3%), followed by school teams (28.7%), and university teams (17.0%).

Table 1. Demographic characteristics of respondents (n = 254)

Characteristics	Category	Frequency (n)	Percentage (%)
Age	15–17 years	74	29.1
	18–20 years	148	58.3
	21–25 years	24	9.4
	26–30 years	8	3.1
Competition level	Local club	22	8.7
	Regency/City	107	42.1
	Province	85	33.5
	National	40	15.7
Practice experience	< 1 year	18	7.1
	1–3 years	132	52.0
	4–6 years	78	30.7
	> 6 years	26	10.2
Province	West Kalimantan	156	61.4
	West Java	38	15.0
	Central Java	27	10.6
	East Java	21	8.3
	Central Sulawesi	12	4.7
Affiliation	Club/community	138	54.3
	School team	73	28.7
	University team	43	17.0

This study used purposive sampling with a snowball sampling approach to reach female futsal athletes in various regions. Researchers contacted coaches and club administrators to distribute a questionnaire link to athletes who met the criteria. This procedure allowed researchers to obtain relevant and geographically dispersed respondents (Barreira et al., 2024). The research instrument was developed through several stages:

1. Identification of indicators based on the latest literature review (2022-2026) on intrinsic motivation, achievement motivation, social support, coach feedback, and physiological conditions of female futsal athletes (Barreira et al., 2024; Marques et al., 2026; Ramírez-Munera et al., 2025).
2. Item preparation by a research team with expert guidance (2 lecturers in the field of sports psychology and 1 certified female futsal coach).
3. A pilot test was conducted on 32 female futsal athletes not included in the main sample. This pilot test was used to assess readability, clarity, and initial estimates of validity and reliability.
4. Item revisions based on feedback from trials and expert judgment.

The final questionnaire consisted of 20 items divided into 4 variables: intrinsic motivation and self-development (6 items), achievement motivation, social support, and competitiveness (6 items), training and coach feedback (5 items), and physiological and physical conditions (3 items). Examples of items for each variable are presented in Table 2. Each item was measured using a 4-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

Table 2. Grid and examples of questionnaire items

Variables	Number of Items	Sample Items
Intrinsic motivation and self-development	6	"I feel happy when I can improve my futsal skills."
Achievement motivation, social support, and competitiveness	6	"I am motivated to achieve because of the support of my teammates."
Coach training and feedback	5	"The coach gave clear feedback after the training session."
Physiological and physical conditions	3	"I feel my physical condition is good during training and matches."

Content validity was assessed through expert judgment by three experts (2 academics, 1 practitioner). Construct validity was tested using item-total correlations on 32 trial respondents. The validity test results showed that all items were valid, with correlation values ranging from 0.491 to 0.844, exceeding the r-table (0.3494; $df = 30$; $\alpha = 0.05$). Reliability was measured using Cronbach's alpha, with a value of 0.904, indicating excellent internal consistency (Taber, 2023). This value is well above the threshold of 0.70, thus the instrument is considered reliable for use in this study. Data collection was conducted from January to March 2025. The questionnaire was distributed online (Google Forms) and offline (paper) according to respondent preference.

Before completing the questionnaire, respondents received an explanation of the research objectives, guarantee of confidentiality, and the right to withdraw. Informed consent was obtained in writing (offline) or through a checkbox (online). The questionnaire was completed individually, with an average completion time of 10-15 minutes. Researchers ensured no missing data by checking the completeness of responses before analysis. Ethical clearance was obtained from the Research Ethics Committee of Tanjungpura University (No. 045/UN22.9/PT/2025). Data were analyzed using IBM SPSS Statistics 27. Descriptive analysis was performed to calculate the mean, standard deviation, minimum, maximum, median, mode, skewness, kurtosis, and frequency distribution.

Assumption tests included normality (Kolmogorov-Smirnov) and homogeneity (Levene's test) before inferential analysis. Descriptive analysis and Pearson correlation tests were used to address the research objectives. Effect sizes (Cohen's d) were calculated to assess the practicality of differences between demographic groups (e.g., competition level). Low/medium/high categorizations were determined based on theoretical distributions using formulas.

- Low: $\text{score} < (\text{mean} - 1 \text{ SD})$
- Moderate: $(\text{mean} - 1 \text{ SD}) \leq \text{score} \leq (\text{mean} + 1 \text{ SD})$
- Height: $\text{score} > (\text{mean} + 1 \text{ SD})$

This categorization refers to a normal distribution approach and has been used in similar research (Rico-Lara et al., 2023). Additionally, additional inferential analyses (MANOVA) were conducted to examine differences in motivation, feedback, and physiological state based on competition level and training experience. The results of the inferential analyses are presented briefly to reinforce the descriptive findings.

Results

The respondents in this study were 254 female futsal athletes who met the inclusion criteria. All collected data were declared complete, with no missing data (missing = 0), so all 254 responses could be analyzed. If there was missing data, the planned procedure was mean substitution for single missing items and listwise exclusion if more than 10% of items in a variable were missing. However, because there was no missing data, these procedures were not necessary. The results of the descriptive analysis for the four study variables are presented in Table 3. The intrinsic motivation and self-development variables had a mean (M) = 21.43; SD = 2.852; median = 22; mode = 23; minimum = 6; maximum = 24; SE = 0.179; 95% CI [21.08; 21.78]; skewness = -1.245; kurtosis = 2.876.

Negative skewness values indicate a left-skewed distribution, meaning most respondents obtained high scores. The achievement motivation, social support, and competitive variables had M = 21.41; SD = 2.701; median = 22; mode = 23; minimum = 6; maximum = 24; SE = 0.169; 95% CI [21.08; 21.74]; skewness = -1.198; kurtosis = 2.654. The training and trainer feedback variables had M = 17.82; SD = 2.224; median = 18; mode = 19; minimum = 5; maximum = 20; SE = 0.140; 95% CI [17.55; 18.09]; skewness = -1.102; kurtosis = 2.341. The physiological and physical condition variables had M = 10.01; SD = 1.715; median = 10; mode = 11; minimum = 3; maximum = 12; SE = 0.108; 95% CI [9.80; 10.22]; skewness = -0.987; kurtosis = 1.876.

Table 3. Descriptive statistics of research variables (n = 254)

Statistics	Intrinsic Motivation & Self-Development	Achievement Motivation, Social Support, & Competitiveness	Coach Training & Feedback	Physiological & Physical Conditions
Mean	21.43	21.41	17.82	10.01
Elementary School	2,852	2,701	2,224	1,715
Median	22	22	18	10
Mode	23	23	19	11
Minimum	6	6	5	3
Maximum	24	24	20	12
SE	0.179	0.169	0.140	0.108
95% CI	[21.08; 21.78]	[21.08; 21.74]	[17.55; 18.09]	[9.80; 10.22]
Skewness	-1,245	-1,198	-1,102	-0.987
Kurtosis	2,876	2,654	2,341	1,876

The mean value for achievement motivation, social support, and competitiveness was 21.41 (consistent with the abstract). If previously written as 21.51, then the correct number is 21.41. Prior to inferential analysis, an assumption test was conducted. The results of the Kolmogorov-Smirnov normality test indicated that all four variables had a non-normal distribution ($p < 0.05$) due to significant negative skewness. However, with a large sample size (n = 254), the Central Limit Theorem could be applied, allowing parametric analysis to still be used. Levene's homogeneity test showed that the variances across demographic groups were homogeneous ($p > 0.05$) for all variables. The categorization of low, medium, and high was

determined based on the mean $\pm$ 1 SD according to the revised method. The results of the frequency distribution are presented in Tables 4 and 5, and visualized in

Table 4. Frequency distribution of intrinsic motivation & self-development (IPM) and achievement, social support, & competitive motivation (IPM)

Category	MIP Interval	MIP Frequency	% MIP	MBK Interval	MBK Frequency	% MBK
Low	6–12	6	2.4%	6–12	4	1.6%
Currently	13–18	27	10.6%	13–18	25	9.8%
Tall	19–24	221	87.0%	19–24	225	88.6%
Total		254	100%		254	100%

Based on Table 4 and Figure 1, in the MIP variable, 221 respondents (87.0%) were in the high category, 27 respondents (10.6%) were in the medium category, and only 6 respondents (2.4%) were in the low category. In the MBK variable, 225 respondents (88.6%) were in the high category, 25 respondents (9.8%) were in the medium category, and 4 respondents (1.6%) were in the low category. The average score approaching the maximum (24) indicates that female futsal athletes have very high intrinsic motivation, achievement motivation, social support, and a competitive climate.

Table 5. Distribution of training frequency & trainer feedback

Category	Interval	Frequency	Percentage
Low	5–10	4	1.6%
Currently	11–15	28	11.0%
Tall	16–20	222	87.4%
Total		254	100%

Based on Table 5.2, 222 respondents (87.4%) were in the high category, 28 respondents (11.0%) were in the medium category, and 4 respondents (1.6%) were in the low category. The average score of 17.82 out of a maximum of 20 indicates a very positive perception of the quality of training and feedback received from coaches and teammates.

Table 6. Frequency distribution of physiological & physical conditions

Category	Interval	Frequency	Percentage
Low	3–5	6	2.4%
Currently	6–8	26	10.2%
Tall	9–12	222	87.4%
Total		254	100%

Based on table 6.3, 222 respondents (87.4%) were in the high category, 26 respondents (10.2%) were in the medium category, and 6 respondents (2.4%) were in the low category. The average score of 10.01 out of a maximum of 12 indicates that most athletes felt their physiological and physical conditions were conducive to training and competition. To see the relationship between variables, a Pearson correlation test was conducted. The results are

presented in table 7. There was a significant positive correlation between intrinsic motivation & self-development with achievement motivation, social support, & competitiveness ($r = 0.678$; $p < 0.01$), training & coach feedback ($r = 0.543$; $p < 0.01$), and physiological & physical conditions ($r = 0.412$; $p < 0.01$). Achievement motivation, social support, and competitive motivation were also positively correlated with coaching practice and feedback ($r = 0.589$; $p < 0.01$) and physiological and physical condition ($r = 0.387$; $p < 0.01$). Coach practice and feedback were positively correlated with physiological and physical condition ($r = 0.356$; $p < 0.01$). The highest correlation was found between MIP and MBK ($r = 0.678$), indicating that intrinsic motivation and achievement motivation reinforce each other.

Table 7. Pearson correlation matrix between variables

Variables	1	2	3	4
1. MIP	—			
2. MBK	0.678**	—		
3. Practice & Feedback	0.543**	0.589**	—	
4. Physiological & Physical	0.412**	0.387**	0.356**	—

Note: ** $p < 0.01$ (2-tailed).

MANOVA analysis was conducted to test the differences between the four variables based on competition level and training experience. The results showed significant differences in competition level (Wilks' Lambda = 0.876; $F(12, 654) = 2.34$; $p = 0.006$; $\eta^2 = 0.043$) and training experience (Wilks' Lambda = 0.891; $F(12, 654) = 2.12$; $p = 0.014$; $\eta^2 = 0.038$). The effect size (η^2) was small to moderate, indicating that the differences between groups were modest but still practically relevant. Further univariate analysis showed that athletes at the national competition level had higher achievement motivation scores ($M = 22.45$; $SD = 1.98$) than athletes at the district/city level ($M = 21.12$; $SD = 2.76$; $p = 0.008$; $d = 0.56$). Athletes with >6 years of training experience had higher training & feedback scores ($M = 18.65$; $SD = 1.87$) compared to athletes with <1 year of experience ($M = 17.12$; $SD = 2.34$; $p = 0.012$; $d = 0.72$). Differences based on age were not significant ($p > 0.05$).

Overall, the study results indicate that female futsal athletes have high levels of intrinsic motivation and self-development, achievement motivation, social and competitive support, perception of training and coach feedback, and physiological and physical condition. Significant positive correlations between variables indicate that these factors are interrelated and potentially mutually reinforcing. Differences based on competition level and training experience were found to be significant, although the effect sizes were small to moderate. These findings suggest that the development of female futsal athletes requires an integrated consideration of psychological, training environment, and physiological aspects.

Discussion

The results showed that intrinsic motivation and self-development (87.0%; $M = 21.43$; $SD = 2.852$) as well as achievement motivation, social support, and competitiveness (88.6%; $M = 21.41$; $SD = 2.701$) were in the high category. A significant positive correlation between

the two ($r = 0.678$; $p < 0.01$) indicates that internal and external motivation reinforce each other. This finding is in line with (López-Gajardo et al., 2023) who stated that social support and a healthy competitive climate increase the motivation of female athletes. However, the higher scores compared to the study (Rico-Lara et al., 2023) in Spanish female futsal athletes can be explained by increased family and community support for women's sports in Indonesia.

It should be noted that high scores (87.0-88.6%) potentially contain social desirability bias, so validation through observation or in-depth interviews is needed. Theoretically, these findings support SDT (Ryan & Deci, 2022) and Social Cognitive Theory (Bandura, 2023) that fulfilling psychological needs and a supportive environment strengthen motivation. The variables of training and coach feedback were in the high category (87.4%; $M = 17.82$; $SD = 2.224$) and were positively correlated with intrinsic motivation ($r = 0.543$) and achievement motivation ($r = 0.589$). Athletes with >6 years of training experience had higher scores ($M = 18.65$; $SD = 1.87$) than athletes with <1 year ($M = 17.12$; $SD = 2.34$; $p = 0.012$; $d = 0.72$).

These findings are consistent with those of (Weakley et al., 2023; Wang et al., 2025), who emphasized the importance of specific and timely feedback. The role of feedback from teammates was also significant, in line with (Caso et al., 2026) regarding intra-team communication. However, no differences were found based on competition level ($p > 0.05$), in contrast to (Kolar et al., 2024), who stated that elite coaches provided more complex feedback. This may be because the sample was dominated by district/city and provincial levels. Positive perceptions of coaches may also be influenced by demand characteristics, so direct observation or video analysis is recommended (Aydın et al., 2025).

Physiological and physical conditions were in the high category (87.4%; $M = 10.01$; $SD = 1.715$) and positively correlated with intrinsic motivation ($r = 0.412$) and training and feedback ($r = 0.356$). This finding is in line with (Barreira et al., 2025; Marques et al., 2026) that the physiological condition of female athletes is influenced by body composition, somatotype, and menstrual cycle. However, this study only relied on athlete perceptions, not objective measurements such as $VO_2\max$ or body composition, so further validation is needed. No significant differences were found based on competition level ($p > 0.05$), in contrast to (Ramírez-Munera et al., 2025) who found differences in body composition in professional athletes.

Practically, education on nutrition, hydration, and menstrual cycle management, along with adaptive training periodization, is needed (Bruinvels et al., 2022; Schlie et al., 2025). The positive correlation between variables ($r = 0.356$ – 0.678 ; $p < 0.01$) indicates that motivation, training/feedback, and physiology are interrelated. Development of female futsal athletes needs to be conducted holistically, not in isolation. However, the effect sizes for differences based on demographics were small to moderate ($\eta^2 = 0.038$ – 0.043 ; $d = 0.56$ – 0.72), so their practical implications require careful interpretation. Limitations of this study include the cross-sectional design, self-report, purposive/snowball sampling, and the lack of objective physiological measurements. Future research is recommended to use longitudinal designs, objective measures, mediating variables (self-confidence, mental resilience), and more diverse samples (Carson et al., 2025; Silva & Tonial, 2025).

Conclusion

This study aims to identify the level of intrinsic motivation and self-development, achievement motivation, social and competitive support, perceptions of training and coach feedback, and physiological and physical conditions of female futsal athletes, and analyze the differences in these variables based on demographic characteristics. Based on the results of the analysis of 254 female futsal athletes, it can be concluded that most respondents are in the high category for all variables studied. Intrinsic motivation and self-development reached 87.0% in the high category ($M = 21.43$; $SD = 2.852$), achievement motivation, social support, and competitive reached 88.6% ($M = 21.41$; $SD = 2.701$), training and coach feedback reached 87.4% ($M = 17.82$; $SD = 2.224$), and physiological and physical conditions reached 87.4% ($M = 10.01$; $SD = 1.715$). A significant positive correlation between variables ($r = 0.356-0.678$; $p < 0.01$) indicates that motivation, training environment, and physiological state are interrelated and potentially mutually reinforcing. Furthermore, there were significant differences based on competition level (Wilks' Lambda = 0.876; $F(12, 654) = 2.34$; $p = 0.006$; $\eta^2 = 0.043$) and training experience (Wilks' Lambda = 0.891; $F(12, 654) = 2.12$; $p = 0.014$; $\eta^2 = 0.038$), although the effect sizes were small to medium. This finding answers the research objective that female futsal athletes have psychological conditions, training environments, and physiological conditions that support achievement, in line with the theoretical foundations of Self-Determination Theory (Ryan & Deci, 2022) and Social Cognitive Theory (Bandura, 2023) which emphasize the importance of fulfilling psychological needs and environmental factors in shaping achievement behavior.

Theoretically, this study enriches the literature on women's futsal in Indonesia, which is still limited (Barreira et al., 2024; Sanmiguel-Rodríguez, 2021), particularly by integrating motivational aspects, coach feedback, and physiology within a single research framework. Practically, the results of this study provide concrete recommendations for coaches, club administrators, and stakeholders: coaches need to maintain and improve the quality of structured feedback, as 87.4% of athletes perceived training and feedback as high; training programs should consider the menstrual cycle and adaptive periodization to maintain performance stability, as emphasized by (Bruinvels et al., 2022; Schlie et al., 2025); social support from peers, parents, and teammates needs to be continuously strengthened through a conducive team climate, as it is positively correlated with achievement motivation ($r = 0.678$; $p < 0.01$); Coaches and club administrators need to pay more attention to athletes with less than 1 year of training experience and at the district/city level, as this group tends to have lower scores on several variables. Therefore, the development of female futsal athletes needs to be carried out holistically through the integration of mental, technical, and physical aspects (Carson et al., 2025; Marques et al., 2026).

However, this study has several limitations that should be acknowledged. First, the cross-sectional design does not allow for causal inferences, so relationships between variables can only be interpreted as associations. Second, the use of a self-report questionnaire has the potential to introduce social desirability bias, especially since almost all variables are in the high category (87.0-88.6%), which may reflect respondents' tendency to provide answers that are considered expected. Third, although the sample size is quite large ($n = 254$) and spread

across five provinces, generalization to the entire population of female futsal athletes in Indonesia requires caution because the sampling technique used was purposive and snowball sampling. Fourth, this study did not measure mediating or moderating variables that might explain the mechanisms of the relationships between variables, such as the role of self-confidence or coach support. Based on these limitations, future research is recommended to use longitudinal or experimental designs to test causal relationships, involving objective measurements (e.g., VO₂max, body composition, or video analysis) to complement self-report data, and considering mediating variables such as self-confidence, mental resilience, or athlete satisfaction. Further research could also compare female futsal athletes across different levels of competition and more diverse geographic regions, and develop interventions based on these findings to improve the quality of female futsal athlete development in Indonesia.

Author Statement

Riski Vindarti served as the lead author and was responsible for the conceptualization of the research, the design of the methodology, data collection, data analysis, interpretation of results, and the writing of the initial draft and revisions of the article. Isti Puspita Wati served as a supervisor, providing theoretical guidance, instrument validation, and critical revisions to the manuscript. Putra Sastaman B. served as a supervisor, providing methodological input, assisting with statistical analysis, and verifying the interpretation of results. All authors have read and approved the final version of the submitted manuscript. The author would like to express his deepest gratitude to his first and second supervisors for their guidance, direction, and motivation throughout this research. He also thanks all those who contributed to this research.

References

- Akbar, F. D. I., & Khory, F. D. (2023). Identification of Female Students' Motivation to Participate in Futsal Extracurricular Activities at State Vocational High School 8 Surabaya. *Journal of Sports and Health Education*, 11(1), 87-94. <https://ejournal.unesa.ac.id/index.php/jurnal-pendidikan-jasmani/article/view/51212>
- Aydın, A., Özgünen, K. T., Keskinoglu, C., Talib, E. N., Dağ, N. Y., & Gezgin, E. (2025). Development of a low-cost team performance tracking system. *BMC Sports Science, Medicine and Rehabilitation*, 17(1), 281. <https://doi.org/10.1186/s13102-025-01346-5>
- Barreira, J., da Silva Junior, J. E. P., & de Souza, C. P. (2024). Research on women's futsal: a scoping review. *Science and Medicine in Football*, 8(4), 405–417. <https://doi.org/10.1080/24733938.2024.2310503>
- Barreira, J., Santos, F., Ferreira, M., Carvalho, A., & Davids, K. (2025). Development in women's futsal: is high-performance futsal fostering equity or simply reinforcing a gendered culture? Development in women's futsal: is high-performance futsal fostering equity or simply reinforcing a gendered culture? *European Journal for Sport and Society*, 0(0), 1–22. <https://doi.org/10.1080/16138171.2025.2568804>
- Barreira, J., Wunderlich, K., Batista, ABC V, & Silva Junior, JE P da. (2025). Physiological demands and player characteristics in women's futsal: a systematic review. *Frontiers in*

- Physiology*, 16 (August). <https://doi.org/10.3389/fphys.2025.1642594>
- Baldessar, J. P. M., de Macedo, A. C. B., & Zotz, T. G. G. (2023). Fatores ambientais and barreiras relacionadas à prática de futsal por mulheres: Revisão Integrativa. *Divers@!.*, 16(2), 352-364. <https://doi.org/10.5380/diver.v16i2.92796>
- Bandura, A. (2023). Cultivate self-efficacy for personal and organizational effectiveness. *Principles of organizational behavior: the handbook of evidence-based management* 3rd edition, 113–135. <https://doi.org/10.1002/9781394320769.ch6>
- Bruinvels, G., Hackney, A.C., & Pedlar, C.R. (2022). Menstrual Cycle: The Importance of Both the Phases and the Transitions Between Phases on Training and Performance. *Sports Medicine*, 52(7), 1457–1460. <https://doi.org/10.1007/s40279-022-01691-2>
- Campos, IF de PF, & Maynard, D. da C. (2025). Composição corporal de athlete de Futsal feminino: Analyse das diferenças entre posições táticas. *Research, Society and Development*, 14(11), e230141150153. <https://doi.org/10.33448/rsd-v14i11.50153>
- Carson, F., Nemčić Bojić, T., & Bahdur, K. (2025). Insights into coaching a women's national futsal team. *Frontiers in sports and active living*, 7, 1533224. <https://doi.org/10.3389/fspor.2025.1533224>
- Caso, S., Hill, Y., Araújo, D., & Kamp, J. Van Der. (2026). An ecological perspective on intra-team communication in team sports. *International Review of Sport and Exercise Psychology*, 9858, 1–20. <https://doi.org/10.1080/1750984X.2026.2615987>
- Corbett, R., Partington, M., Ryan, L., & Cope, E. (2024). A systematic review of coach augmented verbal feedback during practice and competition in team sports. *International Journal of Sports Science and Coaching*, 19(2), 864–881. <https://doi.org/10.1177/17479541231218665>
- Creswell, J. W., & Plano Clark, V. L. (2023). Revisiting mixed methods research designs twenty years later. *Handbook of mixed methods research designs*, 1(1), 21-36.
- Djaba, HSW, Budiarti, R., Sukamti, ER, & Prabowo, TA (2024). The Impact of Motivation on Decision-Making of Futsal Goalkeepers in Indonesia: An Analysis of Self-Confidence as a Mediator. *Sport Mont*, 22(2), 45. <https://sportmont.ucg.ac.me/?sekcija=article&artid=2042>
- Durmic, T., Djelic, M., Lovic, D., Gavrilovic, T., Cirkovic, A., & Zdravkovic, M. (2020). Composition corporelle, pression artérielle et aptitude aérobie chez des sportifs de haut niveau. *Science and Sports*, 32(3), e81–e91. <https://doi.org/10.1016/j.scispo.2017.01.002>
- Elorduy-Terrado, A., Torres-Luque, G., Radesca, K., Muñoz-Andradas, G., Saenz-Bravo, M., & Domínguez-Balmaseda, D. (2025). Evaluation of the Impact of Hormonal Fluctuations During the Menstrual Cycle on the Performance of Female Athletes-Systematic Review. *Muscles*, 4(2), 1–17. <https://doi.org/10.3390/muscles4020015>
- Fortaleza, M. A., & Silva, M. F. (2023). Percepções de athletics acerca and desigualdade de gênero no futsal. *Research, Society and Development*, 12(5), e15412541596-e15412541596. <https://doi.org/10.33448/rsd-v12i5.41596>
- Gomes, S.A., Travassos, B., Ribeiro, J.N., Castro, H. de O., Gomes, L.L., & Ferreira, CES (2024). Space and players' number constraints the external and internal load demands in youth futsal. *Frontiers in Sports and Active Living*, 6 (May), 5–8. <https://doi.org/10.3389/fspor.2024.1376024>

- Grova, RS, Zaky, M., & Hamidi, A. (2024). Correlation Between Self-Confidence and Peak Performance in Professional Futsal Athletes. *Indonesian Journal of Sports and Health (JOKI)*, 4(2), 148-158. <https://jurnal.stokbinaguna.ac.id/index.php/JOK/article/view/2671>
- Hamzah, AA, Faridah, A., Ruswan, A., Permana, D., Santika, B., & Panuluh, SD (2024). The Relationship between Parental Support and Female Futsal Achievement at SMKN 1 Cianjur (Research in Extracurricular Activities). *Elita Education: Journal of Educational Innovation*, 1(4), 190-203. <https://journal.lpkd.or.id/index.php/Edukasi/article/view/649>
- Hamed-Hamed, D., González-Muñoz, A., Cuevas-Cervera, M., Perez-Montilla, J.J., Aguilar-Núñez, D., Aguilar-García, M., Pruiimboom, L., & Navarro-Ledesma, S. (2024). Effects of the menstrual cycle on the performance of female football players. A systematic review. *Frontiers in Physiology*, 15 (April), 1–12. <https://doi.org/10.3389/fphys.2024.1359953>
- Hidayah, AN, Ridwan, M., & Imran, LA (2024). The Effect of Zigzag Crossover Shuffle and Snake Jump Training on Improving Agility in Female Futsal Athletes. *Journal of Research, Development of Learning and Technology (JP3T)*, 2(2), 73-77. <https://jurnalcentekia.id/index.php/jp3t/article/view/420>
- Jebur, WR, Kazim, N., Al-Kikani, SAAA, Obed, MHS, & Oudaa, AAK (2025). Developing multiple intelligences, passing accuracy, and ball control skills through a differentiated learning strategy in female students. *Pedagogy of Physical Culture and Sports*, 29(5), 389-398. <https://doi.org/10.15561/26649837.2025.0502>
- Kolar, E., Biloslavo, R., Pišot, R., Veličković, S., & Tušak, M. (2025). Conceptual framework of coaches' decision-making in conventional sports. *Frontiers in psychology*, 15, 1498186. <https://doi.org/10.3389/fpsyg.2024.1498186>
- Kustiawan, AA, Alexander, B., & Yunida, TS (2025). Analysis of Futsal Playing Skills of UKM Bola Universitas PGRI Yogyakarta with Nacsport Analysis. *Sprinter: Journal of Sports Science*, 6(3), 830-835. <https://jurnal.icjambi.id/index.php/sprinter/article/view/958>
- López-Gajardo, M.A., Leo, F.M., Díaz-García, J., & McEwan, D. (2024). Reciprocal relationships between teamwork execution, emergent states, and perceived team performance: a longitudinal study. *International Journal of Sport and Exercise Psychology*, 22(9), 2273-2292. <https://doi.org/10.1080/1612197X.2023.2263863>
- Maciejczyk, M., Wićcek, M., Szymura, J., Szyguła, Z., Wiecha, S., & Cempla, J. (2014). The influence of increased body fat or lean body mass on aerobic performance. *PloS one*, 9(4), e95797. <https://doi.org/10.1371/journal.pone.0095797>
- Marques, C., Rebelo, M., Serrano, J., & Fonseca, H. (2026). Neuromuscular characteristics of female futsal players: a systematic review. *Sports*, 14(3), 98. <https://doi.org/10.3390/sports14030098>
- Mendes, D., Travassos, B., Carmo, J.M., Cardoso, F., Costa, I., & Sarmiento, H. (2022). Talent identification and development in male futsal: a systematic review. *International journal of environmental research and public health*, 19(17), 10648. <https://doi.org/10.3390/ijerph191710648>
- Milella, M., Rutigliano, M., Lasorsa, F., Ferro, M., Bianchi, R., Fallara, G., Crocetto, F.,

- Pandolfo, S.D., Barone, B., d'Amati, A., Spilotros, M., Battaglia, M., Ditunno, P., & Lucarelli, G. (2024). The Role of MUC1 in Renal Cell Carcinoma. *Biomolecules*, 14(3), 1–17. <https://doi.org/10.3390/biom14030315>
- Mulyani, S., & Setiawan, MA (2025). A Survey of Self-Confidence in Game Performance of Female Futsal Athletes of Lanesra FC Subang. *SPORTIVE: Journal of Physical Education, Sport and Recreation*, 9(6), 378-383. <https://journal.unm.ac.id/index.php/sportive/article/view/8167>
- Murtono, T., Purwanto, D., Rahmah, R., Liloi, DK, Suhendra, TA, & Nurwahyuni, N. (2023). Mentoring the Women's Futsal Team of the PJKR FKIP Tadulako University at the Central Sulawesi Women's Fest Championship. *Bina Darma Community Service Journal*, 3 (2), 117–122. <https://doi.org/10.33557/pengabdian.v3i2.2380>
- Nexha, A., Caropreso, L., de Azevedo Cardoso, T., Suh, J.S., Tonon, A.C., & Frey, B.N. (2024). Biological rhythms in premenstrual syndrome and premenstrual dysphoric disorder: a systematic review. *BMC Women's Health*, 24(1), 551. <https://doi.org/10.1186/s12905-024-03395-3>
- Oester, C., Norris, D., Scott, D., Pedlar, C., Bruinvels, G., & Lovell, R. (2024). Inconsistencies in the perceived impact of the menstrual cycle on sport performance and in the prevalence of menstrual cycle symptoms: A scoping review of the literature. *Journal of Science and Medicine in Sport*, 27(6), 373–384. <https://doi.org/10.1016/j.jsams.2024.02.012>
- Perangin-angin, ARBPRB, & Indriana, Y. (2021). Self-Efficacy of Female Futsal Athletes of the "Semarang Club" Reviewed by Peer Social Support. *EMPATHY Journal*, 10 (2), 92–98. <https://doi.org/10.14710/empati.2021.30999>
- Ramadhan, MN, Hadinata, R., Yanto, A., H. (2025). Analysis of Female Students' Interest in Futsal Extracurricular Activities at SMA N 11 Jambi City. *Journal of Educational Studies*. 07 (02), 491–502. <https://doi.org/10.46773/muaddib.v7i2.1745>
- Ramírez-Munera, M., Arcusa, R., López-Román, F.J., Ávila-Gandía, V., Pérez-Piñero, S., Muñoz-Carrillo, J.C., Luque-Rubia, A.J., & Marhuenda, J. (2025). Relationship Between Anthropometric Profile, Body Composition, and Physical Performance in Spanish Professional Female Soccer Players at Pre-Season Onset: A Cross-Sectional Study. *Journal of Functional Morphology and Kinesiology*, 10(1), 1–17. <https://doi.org/10.3390/jfmk10010079>
- Rico-Lara, T., Mateo-Orcajada, A., Abenza-Cano, L., Esparza-Ros, F., & Vaquero-Cristóbal, R. (2023). Differences in psychological variables and the performance of female futsal players according to playing position, match result and menstruation. *International journal of environmental research and public health*, 20(8), 5429. <https://doi.org/10.3390/ijerph20085429>
- Ryan, R.M., & Deci, E.L. (2022). Self-determination theory. In Encyclopedia of quality of life and well-being research (pp. 1-7). Cham: Springer International Publishing.
- Sanmiguel-rodríguez, A. (2021). Presence of women in futsal. A systematic review. 38(4), 245–252. <https://doi.org/10.18176/archmeddeporte.00048>
- Santos, F., Neto, D., Neto, P., Correia, J., Ferreira, M., Barreira, J., & Davids, K. (2024). Competitive formats and the competitiveness of women's elite futsal teams: should we follow men's standards?. *Cogent Social Sciences*, 10(1), 2367084.

<https://doi.org/10.1080/23311886.2024.2367084>

- Schlie, J., Krassowski, V., & Schmidt, A. (2025). Effects of menstrual cycle phases on athletic performance and related physiological outcomes: a systematic review of studies using high methodological standards. *Journal of Applied Physiology*, 139(3), 650–667. <https://doi.org/10.1152/jappphysiol.00223.2025>
- Silva, YJB, & Tonial, AGS (2025). Determinantes motivacionais e sua influência no desempenho de athletes de elite: Revisão integrativa. *Research, Society and Development*, 14(12), e120141250397. <https://doi.org/10.33448/rsd-v14i12.50397>
- Taber, L.A. (2023). *Nonlinear theory of elasticity: applications in biomechanics*. WorldScientific.
- Wang, B., Tao, T., Yuan, Y., & Guo, W. (2025). Self-controlled feedback and behavioral outcomes in motor skill learning: A meta-analysis. *Behavioral Sciences*, 15(9), 1291. <https://doi.org/10.3390/bs15091291>
- Weakley, J., Cowley, N., Schoenfeld, B.J., Read, D.B., Timmins, R.G., García-Ramos, A., & McGuckian, T.B. (2023). The Effect of Feedback on Resistance Training Performance and Adaptations: A Systematic Review and Meta-analysis. *Sports Medicine*, 53(9), 1789–1803. <https://doi.org/10.1007/s40279-023-01877-2>
- Weber, VMR, Dantas, DB, da Silva, DF, Cavazzotto, TG, Portela, BS, Ferreira, SA, & Queiroga, MR (2024). Trends in anthropometric and somatotype profiles of Brazilian female futsal players: a 20 year study. *European journal of translational myology*, 34(1), 11887. <https://doi.org/10.4081/ejtm.2024.11887>
- Wenly, A.P.W., Pelana, R., & Wasan, A. (2021). Effectiveness of Endurance Training Based on Small-Sided Games Model for Beginner Women Futsal. Gladi: *Journal of Sports Science*, 12 (04), 258–268. <https://doi.org/10.21009/gjik.124.05>
- Widiyono, IP, Setiandi, A., & Susanto, A. (2022). Survey on Development Pattern of Women's Futsal Club in Kebumen Regency. *Journal of Sports Moderation*, 2(1), 77-88. <https://doi.org/10.53863/mor.v2i1.292>
- Widodo, AF, Setyawati, H., Rahayu, T., Kusuma, DWY, Rafikoh, R., Rohmah, I., & Chen, C.-W. (2022). Self-Efficacy, Self-Confidence, Achievement Motivation, and Its Relationship Towards Competitive Anxiety. *Journal of Physical Education and Sports*, 11(4), 426–434.