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# Development and validation of the pre-match anxiety scale for college futsal players (PMAS-CFP)

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## ABSTRACT

**Background:** Anxiety is a major psychological factor that significantly affects the performance of college futsal players, so coaches need to understand anxiety. However, existing anxiety scales are not explicitly developed for futsal and often overlook critical pre-match external stressors, such as the opponent's reputation and audience pressure, which are highly influential in the futsal environment. As a result, pressure in these areas is still ignored.

**Objective:** To develop an instrument that can measure the pre-match anxiety scale for college futsal players (PMAS-CFP). **Methods:** This study employed an R&D design, incorporating content validity, ICC testing, construct validity, and reliability testing. Fourteen items were designed using three indicators: concentration impairment, somatic anxiety, and worry. **Findings/Results:** Psychometric testing showed strong content validity (Aiken's  $V = 0.67-0.96$ ), acceptable ICC (0.550), adequate construct validity (factor loadings = 0.60-0.82), high internal consistency (Cronbach's  $\alpha = 0.922$ ), good CFA loadings (0.667-0.946), composite reliability (CR = 0.965), and average variance extracted (AVE = 0.681). A total of 13 items met the required validity and reliability standards, consisting of concentration disorders (3 items), somatic anxiety (5 items), and worry (5 items).

**Conclusion:** The PMAS-CFP is a valid and reliable tool for assessing pre-match anxiety in college futsal players, filling a gap in existing non-sport-specific anxiety measurements. This scale can help sports psychologists and coaches monitor athletes' psychological readiness. Future studies are recommended to expand the use of this tool during and after matches, as well as to validate its use at broader levels of competition.


**Keywords:** Sports anxiety scale; futsal player anxiety scale; beginner athlete anxiety scale

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## INTRODUCTION

Anxiety is a common psychiatric symptom characterized by feelings of uncertainty, fear, and worry (Grzech et al., 2025; Brahmabhatt et al., 2021). Spielberger separates anxiety into two parts, namely trait anxiety and state anxiety (Najafabadi et al., 2020). Trait anxiety is a psychological trait that causes a person to see

18 various daily events as potentially dangerous (Berchio et al., 2019). Meanwhile, state anxiety is a temporary, unpredictable emotional state caused by a person's perception that the situation at hand poses a threat (Setyananda et al., 2021). In competitive self-confidence, individuals who have high anxiety become less likely to be confident (Goette et al., 2015). This disorder will affect various aspects, such as cognitive dysfunction, concentration disorders, and even decreased athletic performance caused by anxiety over several factors, including performance expectations and public scrutiny (Fadare et al., 2022; Najafabadi et al., 2020; Reardon et al., 2023). This justification leads to the conclusion that anxiety affects athletes' ability to succeed.

52 Coaches must recognize the breadth of their role as a valuable source of support for athletes' mental health by identifying anxiety, facilitating treatment, and encouraging participation in sports (Mazzer & Rickwood, 2015), as well as describing, understanding, predicting, and managing the symptoms of anxiety experienced by athletes (Kusumawati & Mylsidayu, 2015), and fostering a team culture that supports athletes' mental health (Bissett et al., 2020), thereby enabling athletes to perform at their best. Several studies have proven that a positive relationship between coaches and athletes can reduce athletes' anxiety (Wilczyńska et al., 2022; Sridana et al., 2024). However, because mental disorders such as anxiety are not permanent, they need to be monitored continuously (Bentzen et al., 2022). To identify and evaluate player anxiety, coaches must use valid, reliable, and practical tools so that anxiety behaviors and efforts to overcome athlete anxiety become more precise and impactful. This includes college futsal players, as the various activities they undertake as students require them to manage their anxiety to remain successful in futsal matches.

31 Several authors have successfully developed athlete anxiety scales, such as the Athlete Anxiety Questionnaire (Trpkovici et al., 2023), and the Sport Injury Anxiety Scale (Rex & Metzler, 2016). However, the most popular among international researchers is the Sport Anxiety Scale-2 (SAS-2) developed by (Smith et al., 2006). The SAS-2 uses 15 items, each constructed using three indicators, namely somatic anxiety (items 2, 6, 10, 12, 14), worry (items 3, 5, 8, 9, 11), and concentration disruption (items 1, 4, 7, 13, 15) on 4 Likert scales (not at all-very much). Noting the efficacy of SAS-2, several researchers have carried out Cross Cultural Adaptation of SAS-2 to facilitate its use in various countries, including in China (Zhang et al., 2023; Li et al., 2023), in Colombia (Riveros Munévar et al., 2024), in Malaysia (Hashim et al., 2017), in Turkey (Karadağ & Aşçı, 2020) in the Persian people (Moghada Zadeh et al., 2017), in Korea (Cho et al., 2018), in Brazil (Silva-Rocha et al., 2019), in Indonesia (Putra et al., 2021), and in Poland (Rawat et al., 2023; Tomczak et al., 2022).

The adaptation of SAS in Indonesia has been reported in two scientific publications. First, Amir (2012) has adapted the SAS-1. The adaptation study produced 22 items for measuring athlete anxiety using four indicators, namely motor, affective, somatic, and cognitive. Second, the adaptation of SAS-2 was carried out by Putra et al. (2021) using a sample of 268 elite Papuan athletes (male = 154 and female = 114) with an age range of 16-43 years who were undergoing training camp at PON (National Sports Week). They represented four sports criteria: athletics, rowing, and swimming (measured); archery and shooting (precision); and volleyball, basketball, and soccer (games). Additionally, they included kempo, muay thai, boxing, pencak silat, and combat (martial arts). Produced 15 items on the anxiety scale that were valid and reliable.

Previous studies in Indonesia have mainly focused on existing international scales such as SAS-1 and SAS-2 (e.g., Amir, 2012; Putra et al. 2021), but no instruments have been developed specifically for the contextual characteristics of futsal or college athletes. Furthermore, widely used scales such as SAS-2 do not include external competitive factors such as audience intensity or opponent reputation, which are known to trigger pre-match anxiety in futsal (e.g., Hashim et al. 2017; Rawat et al. 2023). Therefore, this study fills this gap by developing a context-specific and culturally relevant measure of pre-match anxiety that integrates internal symptoms and external situational stressors.

## METHOD

### Research Design

11 In accordance with the research objectives, the design used in this study was Research and Development (R&D) using a protocol model developed by (Oriondo & Antonio, 1998), which consists of three main stages: instrument design, instrument testing, and instrument assembly.

## Participants and Sampling

The participants in this study were 114 active and experienced futsal players (mean age = 18.82 ± 1.66) from the Physical Education study program at the Faculty of Sports Science, Universitas Negeri Padang, who voluntarily participated in the pilot and validation stages. The same sample was used consistently in item development, content validity, reliability testing, and CFA procedures.

## Instrument Development

First, the design, where the researcher determines 1) the purpose of the instrument, to develop a measuring instrument (Likert scale) to measure and assess the anxiety of college futsal players. The Likert scale is easy to answer and supports parametric testing (Wijnen et al., 2021), 2) Determine the competency being tested, which is that college futsal players can control their anxiety levels before a match. This control will run smoothly if you first know the indicators that can affect your anxiety through credible measuring instruments, 3) The determination of the tested material, namely the anxiety material, specifically on student futsal players. Furthermore, 4) determine the indicators of scale development, namely concentration disruption, somatic anxiety, and worry from Smith et al. (2006) to develop the PMAS-CFP instrument, 5) determine the scale items. In the initial design, the researcher formulated 14 items using a 5-point Likert scale model, 6) validation of instrument items.

The second stage, the trial, includes: 1) determining the trial subjects, where the instrument was tested on 114 students of the Physical Education study program, Faculty of Sports Science, Universitas Negeri Padang, and 2) conducting the scale trial from July 19 to September 21, 2025.

Finally, the assembly, during which the researchers conducted a series of development stages and tested the anxiety scale in sports before the college futsal players' matches, resulted in the finalization of the instrument. This included the items, responses, scoring, and classification of the players' anxiety levels.

## Validity Test

### Content Validity (Aiken's V)

A total of eight experts were involved in this study, consisting of four theoretical experts (lecturers with 7-16 years of teaching experience) and four practical experts (futsal players and coaches) (see Table 1). The study emphasizes the importance of using a heterogeneous panel of experts (Arzahan, 2021), and several studies have reported that panels of fewer than 10 experts can produce high-quality validation (Parsazadeh & Cheng, 2025; Blegur et al., 2024; Ziebart et al., 2022). The scale content design was validated by four theoretical experts (lecturers with 7-16 years of teaching experience) and four practical experts (futsal players and coaches) (see Table 1) who assessed it using a 4-point rating scale.

Table 1. Validator Team

No	Validator	Gender	Age (Years)	Affiliation	Expertise Area
1	Validator A	Male	35	Universitas Negeri Padang	Futsal Learning
2	Validator B	Male	48	Universitas Jambi	Futsal Training
3	Validator C	Male	37	Universitas Riau	Measurement and Evaluation Tests
4	Validator D	Male	33	STOK Bina Guna	Futsal Training
5	Validator E	Male	37	Independent Futsal Coach	Futsal Training
6	Validator F	Male	32	Madrasah Aliyah Negeri 1 West Pasaman Futsal Coach	Futsal Training
7.	Validator G	Male	31	West Pasaman Futsal Athletes	Futsal Athletes
8.	Validator H	Male	25	West Sumatra Porprov Futsal Athletes	Futsal Athletes

The validation results were analyzed using the Aiken formula (Acosta-Banda et al., 2021), with the Aiken parameter set at 0.75 or higher. Furthermore, to test inter-rater agreement, intraclass correlation coefficients (ICC) were used, referring to the norm of (Koo & Li, 2016), with a 95% confidence interval, namely > 0.50.

- 7) Item improvement was not used in this study, so items that did not meet the test parameters were eliminated.
- 8) The scoring guidelines were developed using low, moderate, high, and very high criteria.

**Construct Validity (Pearson, CFA)**

After the instrument is valid in terms of content, the next step is to conduct construct validity using the Pearson correlation formula by calculating the correlation between item scores and total scores. In addition, a Confirmatory Factor Analysis (CFA) is conducted to ensure that the theoretically designed factor structure is consistent with the empirical data. Furthermore, the instrument also undergoes a convergent validity test through Average Variance Extracted (AVE).

**Reliability Testing**

Reliability testing was conducted through several stages, including inter-rater reliability testing using Intraclass Correlation Coefficients (ICC). Then, internal consistency was assessed using Cronbach’s alpha and Composite Reliability (CR).

**Data Analysis**

Data analysis was carried out in accordance with the predetermined stages, starting from content validity testing with Aiken V to Average Variance Extracted (AVE). All stages of data analysis were carried out using Excel and Jamovi version 2.6.44.

**RESULTS AND DISCUSSION**

**Results**

An essential stage in instrument development is the assessment of its validity and reliability (Greco et al., 2018). This ensures that the items developed are valid for accurately measuring their intended purpose and reliable for estimating measurement error, thereby aligning with the research objectives. Researchers used two validity tests during instrument development: content validity and construct validity. Both types of validity are often the standard in testing instrument validity (Loch et al., 2021). To facilitate the testing process, researchers followed the protocol (Oriondo & Antonio, 1998). In the protocol, researchers will conduct a series of validity and reliability tests in three main stages, as follows.

**Instrument Design**

Based on the anxiety indicators from Smith et al. (2006), the researcher successfully designed 14 statement items for the PMAS-CFP Scale (see Table 2). Each concentration indicator consists of three items (numbers 1-3), the somatic anxiety indicator comprises six items (numbers 4-9), and the worry indicator comprises five items (numbers 10-14). As stated in the final paragraph of the introduction section of this article, this scale design tries to internalize external factors that also have the potential to contribute to the anxiety of novice athletes, such as “audience euphoria” (see item 10), “flying hours” or “big names” of opposing players (see item 11).

**Table 2. Indicators, Descriptions, and Statement Items**

Indicator	Description	Statements
Concentration disruption	Involved difficulties in focusing on task-relevant cues	1. I was unable to think clearly before the match.
		2. I can't concentrate if I am spoken to before the match.
		3. I think the coach will scold me if I make a mistake in the match.
		4. My breathing becomes faster in the moments leading up to the match.
Somatic anxiety	Various indices of autonomic arousal centred in the stomach and muscles	5. My heart rate is faster before the match.
		6. I feel the urge to urinate before the match.
		7. I sweat before the match starts.
		8. My knees feel shaky before the match.
		9. My body feels cold before the match.
Worry	Involved concerns about performing	10. I feel nervous when I see the audience.
		11. I feel nervous when I see my opponent before the match.

Indicator	Description	Statements
	poorly and the resulting negative consequences	12. I got scared before the match. 13. I am afraid that I will lose. 14. I don't feel more relaxed when the match is about to start.

The completed instrument design was then tested for content validity. Content validation was conducted by a panel of eight experts and evaluated using Aiken V. In this study, the Aiken-V threshold was set at 0.75, based on the Aiken table. Using a scale of 1-4, the validators gave a maximum score of 4 and a minimum score of 2, with an average validator score of 3.60 on the statement items (see Table 3).

Table 3. Validator Assessment Results (Content Analysis)

Item	Validator								M ± SD	Aiken-V	Decision
	1	2	3	4	5	6	7	8			
1	4	3	3	3	3	4	3	4	3.29 ± 0.49	0.79	Valid
2	3	4	4	3	3	4	4	4	3.57 ± 0.53	0.88	Valid
3	3	4	3	4	4	4	4	3	3.71 ± 0.49	0.88	Valid
4	4	4	4	4	4	4	3	4	3.86 ± 0.38	0.96	Valid
5	4	4	4	4	4	4	4	4	4.00 ± 0.00	1.00	Valid
6	4	3	4	3	3	4	3	3	3.43 ± 0.53	0.79	Valid
7	2	3	3	3	3	4	4	4	3.14 ± 0.14	0.75	Valid
8	2	3	3	2	3	4	4	3	3.00 ± 0.82	0.67	Invalid
9	2	3	4	2	4	4	4	4	3.29 ± 0.95	0.79	Valid
10	4	4	4	4	4	4	4	3	4.00 ± 0.00	0.96	Valid
11	4	4	4	4	4	4	4	3	4.00 ± 0.00	0.96	Valid
12	4	3	3	4	4	4	3	4	3.57 ± 0.53	0.88	Valid
13	4	4	4	2	4	4	4	4	3.71 ± 0.76	0.92	Valid
14	4	4	3	3	4	4	4	4	3.71 ± 0.49	0.92	Valid

Of the 14 items validated by the expert panel, the highest Aiken value of 1.00 was observed for item 5. Conversely, the lowest Aiken value was 0.67 for item 8; based on the Aiken table, the comparative value is thus 0.75. This results in a V score below the acceptable threshold (V = 0.67) and is removed as less relevant in the context of futsal. This results in a draft instrument with 13 items. The next step was to test inter-rater reliability using ICC analysis, with all items then assessed for agreement among the expert panel in evaluating each item. The ICC analysis results found an average measure value of 0.550 (Sig. = 0.009), which is classified as moderate (> 0.50). Thus, the items proceeded to the trial test (construct validity).

### Instrument Testing

After the scale underwent content validity testing and inter-rater reliability testing by a panel of experts, it was then tested (construct validity) on 114 students majoring in Physical Education at the Faculty of Sports Science, Universitas Negeri Padang. If a construction exceeds the r-table value, then that construct is considered valid. The 13 scale items that were considered valid at the previous level were tested for construct validity (item number 8 was not evaluated because it did not pass the Aiken analysis stage). Table 4 shows that 13 items are valid because the r-count value is greater than the r-table value.

Table 4. Description and Pearson Correlation Analysis

Item	M ± SD	Pearson	r-table	Decision
1	3.28 ± 1.10	0.60	0.183	Valid
2	3.64 ± 1.15	0.67	0.183	Valid
3	2.88 ± 1.17	0.66	0.183	Valid
4	2.98 ± 1.08	0.77	0.183	Valid
5	2.75 ± 1.14	0.79	0.183	Valid
6	2.96 ± 1.10	0.65	0.183	Valid
7	3.61 ± 1.18	0.71	0.183	Valid
8	4.00 ± 1.09	0.75	0.183	Valid
9	3.59 ± 1.18	0.75	0.183	Valid

Item	M ± SD	Pearson	r-table	Decision
10	3.72 ± 1.10	0.75	0.183	Valid
11	3.96 ± 1.08	0.82	0.183	Valid
12	3.04 ± 1.37	0.66	0.183	Valid
13	3.44 ± 1.13	0.79	0.183	Valid

The item-total correlation analysis in Table 4 shows that the calculated r values range from 0.60 to 0.82, which are greater than the table r value of 0.183. Therefore, it can be stated that all items are valid, and the next step is to test reliability. Based on Cronbach's Alpha reliability test, a value of 0.922 was obtained, which meets the reliability standard (see Table 5).

**Table 5. Reliability Cronbach Alpha**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.922	0.923	13

The reliability test, using Cronbach's Alpha, yielded a very significant value of 0.922, indicating that the PMAS-CFP instrument has a very high level of reliability. The next stage of construct validity is to use Confirmatory Factor Analysis (CFA) (Alavi et al., 2020). However, before performing CFA analysis, the data must meet the Kaiser-Meyer-Olkin (KMO) requirements (see Table 6).

**Table 6. Kaiser-Meyer-Olkin dan Bartlett**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.896
	Approx. Chi-Square	835.391
Bartlett's Test of Sphericity	df	78
	Sig.	0.000

The KMO results show a value of 0.896, which is > 0.50; therefore, factor analysis using CFA can be performed. KMO can evaluate the correlation between variables, making it relevant for factor analysis by measuring sample adequacy (Shrestha, 2021; Huzsvai et al., 2021). Next, the CFA PMAS-CFP analysis was conducted using Jamovi software version 2.6.44. The results of the CFA construct validity analysis are shown in Table 7.

**Table 7. Confirmatory Factor Analysis (CFA)**

Factor	Indicator	Estimate	SE	Z	p	Decision
Concentration disruption	1	0.685	0.1080	6.35	< .001	Valid
	2	0.808	0.1106	7.31	< .001	Valid
	3	0.719	0.1094	6.57	< .001	Valid
	4	0.946	0.0969	9.76	< .001	Valid
Somatic anxiety	5	0.935	0.0911	10.26	< .001	Valid
	6	0.667	0.0973	6.85	< .001	Valid
	7	0.800	0.1010	7.93	< .001	Valid
	8	0.784	0.0919	8.53	< .001	Valid
	9	0.897	0.0961	9.33	< .001	Valid
Worry	10	0.837	0.0898	9.32	< .001	Valid
	11	0.909	0.0836	10.88	< .001	Valid
	12	0.808	0.1212	6.66	< .001	Valid
	13	0.871	0.0912	9.54	< .001	Valid

The CFA test results show factor loading on the concentration disruption indicator ranging from 0.685 to 0.808. In contrast, the somatic anxiety indicator had factor loadings of 0.667-0.946, and the worry indicator had factor loadings of 0.808-0.909. Based on the sample size, the comparative value was 0.50, indicating that all three indicators had factor loadings greater than 0.50. Thus, all items were declared valid through CFA.

The next step was to conduct further reliability testing on all items declared valid. Further reliability testing in this study was conducted using Composite Reliability (CR). The CR results are shown in Table 8.

**Table 8. Composite Reliability**

Composite Reliability	N of Items	Decision
0.965	13	Reliable

The CR analysis yielded a value of 0.965 (> 0.70), indicating excellent construct reliability, and the PMAS-CFP instrument was declared to meet the composite reliability standard. The final stage in this study was the convergent validity test using Average Variance Extracted (AVE) (see Table 9).

**Table 9. Average Variance Extracted**

Average Variance Extracted	N of Items	Decision
0.681	13	Valid

The analysis results show an AVE value of 0.681. An AVE value > 0.50 indicates that the convergent validity standard has been met. Thus, the 13 items of the PMAS-CFP are valid, reliable, and therefore suitable for use.

**Instrument Assembly**

After undergoing a series of analyses consisting of content validity (Aiken), ICC, construct validity (Pearson correlation), Cronbach's Alpha reliability analysis, Confirmatory Factor Analysis (CFA), Composite Reliability (CR), and Average Variance Extracted (AVE), the 14 items (initial design) were reduced to 12 items, only 13 items proved to meet the testing parameters. One item was eliminated from the somatic anxiety indicator, namely "My knees feel shivering before the match." Thus, the 13 items suitable for use in constructing a scale of anxiety among college futsal players are as follows: 1) concentration disruption (items 1-3), 2) somatic anxiety (items 4-8), and 3) worry (items 9-13) which will be responded to by respondents on a 5-point Likert scale, always-never (see Table 10). Referring to the 13 number of items with responses on five scales, and using five interval classes, the determination of the categorization or classification of the PMAS-CFP instrument is as follows: 1) score ≤ 13 is categorized as very low, 2) score 14-26 is categorized as low, 3) score 27-39 is categorized as medium, 4) score 40-52 is categorized as high and 5) ≥ 53 is very high.

**Table 10. Pre-Match Anxiety Scale of College Futsal Players (PMAS-CFP)**

No	Statement	Responses				
		Always	Often	Sometimes	Rare	Never
1	I was unable to think clearly before the match.					
2	I can't concentrate if I am spoken to before the match.					
3	I think the coach will scold me if I make a mistake in the match.					
4	My breathing becomes faster in the moments leading up to the match.					
5	My heart rate is faster before the match.					
6	I feel the urge to urinate before the match.					
7	I sweat before the match starts.					
8	My body feels cold before the match.					
9	I feel nervous when I see the audience.					
10	I feel nervous when I see my opponent before the match.					
11	I got scared before the match.					
12	I am afraid that I will lose.					
13	I don't feel more relaxed when the match is about to start.					

## Discussion

This study aims to develop a scale to measure anxiety among college futsal players through validity and reliability testing. The test results show that of the 14 items developed, 13 items successfully met the test parameters. One item (item number 8) was eliminated at the content validity test stage ( $0.67 < 0.75$ ). Content validity is a critical first step in the development of measurement instruments to assess whether the items accurately represent the intended construct (Zapata-Ospina & García-Valencia, 2020; Almasreh et al., 2019). This validity precedes and supports other forms of validity, including construct validity, which involves expert review to evaluate items (Heale & Twycross, 2015; Shrotryia & Dhanda, 2019; Zamanzadeh et al., 2015). After testing content validity, the next step is to test inter-rater reliability using Intraclass Correlation Coefficients (ICC) (Hardiansyah & Zalindro, 2025). In the ICC test, the developed items had an average measure of 0.550 (Sig. = 0.009), thus meeting the test parameter ( $> 0.50$ ) (Koo & Li, 2016).

Next, construct validity was assessed to determine the extent of the relationship between scores by correlating item scores with total scores (Greco et al., 2018; Mortaz Hejri et al., 2023; Gündüz et al., 2019), and the results showed that all items met the parameters because they had Pearson values  $> 0.183$  (0.60-0.82). Next, Cronbach's Alpha was used to assess the internal consistency of several items by evaluating the correlation among them (Kotian et al., 2022). The Cronbach's Alpha result was  $0.922 > 0.90$ , indicating that the instrument met the reliability criteria and was therefore acceptable (Hair Jr et al., 2020; Cerri et al., 2023). The following analysis was a Confirmatory Factor Analysis (CFA), which yielded factor loadings ranging from 0.667 to 0.946, a Composite Reliability (CR) of 0.965, and an Average Variance Extracted (AVE) of 0.681. CR indicates minimal differences between CFA and exploratory structural equation modeling (Fu et al., 2022), with multilevel extensions that address observed versus latent composite scores (Lai, 2021). AVE aims to test construct validity in structural equation modeling approaches (Almazrouei et al., 2021). An AVE value  $> 0.50$  indicates that the convergent validity standard has been met (Li & Lay, 2025; Baharum et al., 2023), so that this scale is considered valid and reliable for measuring pre-match anxiety among futsal players among university students because it has met the statistical methods for assessing the validity and reliability of the instrument (Loch et al., 2021).

The PMAS-CFP instrument is unique compared to previous athlete anxiety instruments, such as those developed by Trpkovici et al. (2023), which focus more on measuring anxiety during competition, as well as the anxiety instrument from Teixeira et al. (2021), which aims to measure anxiety in athletes in the context of sports in general. In comparison, the PMAS-CFP is designed to measure anxiety specifically in futsal players before a match. Until now, the familiar scale used to measure athlete anxiety has been the SAS-2 developed by (Smith et al., 2006). The scale developed by the researchers not only considers the level of novice athletes, but also refers to the indicators used by Smith et al. (2006) when creating the SAS-2 (concentration disruption, somatic anxiety, and worry). However, for the worry indicator, the researchers also integrated external factors that affect athletes' anxiety before a match. This integration was considered because recent research by Aji et al. (2025) revealed that several external anxiety triggers, such as spectators, coaches, opponents, and facilities, can cause high levels of anxiety. This is reinforced by the findings of Reardon et al. (2023), which reveal that public scrutiny affects anxiety. Therefore, measuring external factors is important so that coaches can identify the potential anxiety experienced by their athletes and devise strategies to overcome it.

Futsal is a sport activity that is full of tension, especially during competitive play (Najafabadi et al., 2020), as it involves technical-tactical skills and mental balance at high intensity (Naser et al., 2017; Spyrou et al., 2020). Players' success cannot be determined solely by their physical and technical skills; it also depends on their psychological skills. Therefore, the proportion of physical and mental skill training must be adequately considered (Lubis et al., 2022). Athletes' anxiety about their performance is one of the most critical factors affecting the outcome of a sports competition (Palazzolo, 2020). Thus, the results of this scale's development can be a credible instrument for coaches to assess players' psychological skills (such as anxiety), enabling anxiety diagnoses and treatment with various interventions to help college futsal players control their anxiety before the match.

Anxiety seems simple, but it has a significant impact on accelerating the improvement of athlete performance (beginner and elite). When athletes are unable to control their anxiety, it will negate the physical

state, procedures, and strategies they have prepared (Wismanadi, 2017), resulting in injury (Sajedi & Kirkbir, 2020), and a decrease in athletes' sports performance (Akbar et al., 2022; Bukhari et al., 2021; Marwat et al., 2021). In short, anxiety significantly impacts an athlete's competitive performance and career in both the short- and long-term (Datcu et al., 2021). For this reason, anticipating players' inability to control their anxiety before the match is an effort to increase opportunities for college futsal players to develop more optimally.

The findings of this study have important practical implications for futsal coaches in higher education. The PMAS-CFP can be an objective tool for identifying players' anxiety before a match, enabling coaches to determine preventive measures. Meanwhile, for sports psychologists, the PMAS-CFP instrument can serve as an initial assessment tool before providing psychological intervention for futsal players. The development of this instrument has been carried out with great care. However, the PMAS-CFP developed in this study still has limitations that must be acknowledged to open opportunities for future researchers. First, the sample only involved students from the Physical Education study program at Universitas Negeri Padang. It was not tested on professional athletes, so generalization to a broader sample requires further testing. Second, no retesting was conducted, so the consistency of participants' answers is unknown. Third, the PMAS-CFP instrument was not designed to measure the anxiety of futsal players during matches, as players may experience anxiety during matches. Therefore, it is recommended that future researchers conduct research on the anxiety experienced by futsal players during matches and also conduct research on anxiety in other sports.

## CONCLUSION

The PMAS-CFP instrument successfully developed in this study can be used to measure pre-match anxiety in student futsal players. The results of the study confirm that the instrument for measuring anxiety in student futsal players before a match, which consists of three indicators, namely concentration disruption (3 items), somatic anxiety (5 items), and worry (5 items), has met the standards of validity and reliability through content validity testing, intraclass correlation coefficient testing, item-total correlation, Cronbach's alpha, confirmatory factor analysis, composite reliability, and average variance extracted. Therefore, the PMAS-CFP instrument can be used to assess anxiety levels among futsal players before a match. The results of this study can help bridge the gap between coaches' practical needs and theoretical support, particularly in identifying anxiety levels among futsal players before a match.

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## CONFLICT OF INTEREST

The authors state no conflict of interest.

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