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# Development of the referee anxiety scale in officiating football matches

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**ABSTRACT**

A referee's important roles often lead to anxiety that affects the psychological stances in the decision-making while officiating a match. In this light, the present study aimed to develop a valid and reliable anxiety scale for football referees. The research and development method was applied in this study by involving 13 referees and 5 experts in the selection and determination of the details of the statement. The subjects of the tryout were 30 football referees in Aceh Province. The Football Referee Anxiety Scale (FRAS) is developed through the analysis of various anxiety instruments that have been developed, item selection, small scale, and large-scale tryouts, and factor analysis to test its validity and reliability. The results showed that the referee anxiety scale in a football match had high levels of validity and reliability. The scale comprised 51 questions in four dimensions, which consisted of 10 questions for the cognitive dimension, 17 for the affective dimension, 17 for the somatic dimension, and 7 for the motoric dimension. This scale could be used for the football referees at the regional and national levels. This referee anxiety scale could be refined through a test on a larger number of referees in the different match levels.

**Keywords:** scale, anxiety, referee, football

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## INTRODUCTION

The success of a football match cannot be separated from various supporting components, including match organizers, managers, coaches, players, officials, referees, and spectators. Without these, a football match cannot be conducted properly. In the world of football, the success or failure of a match is not only the responsibility of the players, manager, or coach but is more dominantly determined by the leadership of the referee (Johansen & Haugen, 2013). Accordingly, the referee must possess a very strong mentality to officiate the match properly. Anxiety is one of the mental factors that need to be controlled by the referee since it can affect and interfere with the performance of a referee's leadership in the football field. Anxiety is an individual's anticipatory response to a situation that is considered dangerous and threatening to him in the future (Fekih et al., 2021). The threat causes unpleasant feelings characterized by a high tension followed by fear, worry, and anxiousness, which makes an individual unable to naturally respond to the danger (Borrego et al., 2012; Castro-Sánchez et al., 2019).

Various studies reported that referees used mental abilities significantly in determining the goal, confidence, involvement, fear control fear, concentration, distraction control, imagery, and planning abilities, but showed a low ability in terms of activation, relaxation, reaction to stress, and mental practice (Alfonso Castillo-Rodríguez et al., 2021; Gouttebarge et al., 2017; Johansen & Haugen, 2013). The research conducted on 55 Indonesian referees revealed that anxiety instruments play an important role in measuring a referee's anxiety before a match. The developed instrument consists of four factors with 35 instruments (Amir, 2013).

A high and uncontrolled level of anxiety can result in a referee's becoming afraid of failure in officiating a match, social consequences, a quality decline, injury, or any other harms befalling

on him, a physical condition that causes him to be unable to complete a task, and physical or nonphysical aggression from spectators, players, or coaches before, during, or after officiating the match (Pedrosa & García-Cueto, 2016). This is directly proportional to the scale of experience in officiating matches, between those accustomed to officiating national matches and those officiating regional ones (Alfonso Castillo-Rodríguez et al., 2021). The referees' worries, anxiety, and uneasiness are due to their assumption that a match is something dangerous. The most dominant element that causes anxiety is the cognitive element of worry and negative thought assuming that the match can threaten the referee's position (Borrego et al., 2012). Anxiety describes the referee's feeling unexpected things are going to happen, for example, a mistake in decision making, intimidation by the players, coaches, officials, causing him to be ridiculed by spectators, which leads to building a chain of concerns (Hoseini et al., 2011), and this condition causes very unfavorable impacts on the referee.

The referees who experience emotional pressures from players, officials, and spectators will lead to the disturbance of their cognitive, affective, somatic, and motoric skills that make them unable to officiate the match properly (Louvet et al., 2015; Muñoz Arjona, 2021). Based on the results of the interview with seven referees and the Board of PSSI (Indonesian Football Association) of Aceh Province, it can be described that referees often experienced emotional disturbances in the form of anxiety when officiating matches. However, no valid and reliable measuring tool was available to measure the referee's anxiety scale while officiating a match. In addition, many anxiety instruments have been developed, such as the Taylor Manifest Anxiety Scale, Trait Anxiety Inventory, State Anxiety Inventory, Competitive State Anxiety Inventory, and Sport Anxiety Scale have not specifically measured the referee anxiety, Therefore, this study was proposed to develop an anxiety scale of football referees with adequate validity and reliability levels so that it can be used for early detection of readiness before officiating a football match.

## METHOD

### Design

This research applied research and development (R &D) methods (Ary et al., 2010) with the following stages: (1) analysis of various anxiety instruments that have been developed; (2) collection and selection of items; (3) scale tryouts; and (4) factor analysis to test validity and reliability to obtain a valid and reliable scale. The analysis of various anxiety instruments was conducted by comprehending and taking appropriate items to be used as points for the football referee anxiety scale. Taylor Manifest Anxiety Scale (TMAS) was developed in 1951 and consisted of 50 items with alternative yes/no answers. Trait Anxiety Inventory (TAI) developed by Spielberger contained 20 items to measure general nontransitory anxiety. Spielberger also developed the State Anxiety Inventory (SAI) as a pair of Trait Anxiety Inventory (TAI) consisting of 21 questions starting with a 4-point Likert scale. In addition, Competitive State Anxiety Inventory I (CSAI I) was also developed by Spielberger with 5 items. Furthermore, Competitive State Anxiety Inventory-II (CSAI II) was developed by Martens, Burton, Vealey, Smith, and Bump (1981) to measure the multidimensional State-A aspect of the competition, consisting of 27 items in a form of 4 point Likert scale. Smith, Smoll, and Schuts (1990) also developed an instrument to measure the anxiety of sports competitions that distinguish between cognitive and somatic aspects developed the Sport Anxiety Scale (SAS).

Interviews and nominal group processes were used to collect and select the items to obtain the information of the knowledge related to the four dimensions used in the football referee anxiety scale. The nominal group process was carried out by providing an opportunity to the referees to discuss and participate actively, and alternately express their opinions. Each respondent could write an opinion on a predefined paper. The collection of designated items through the nominal group process was conducted by involving 10 referees in Aceh Province. Meanwhile, the nominal group process was conducted by following the simplified opinion of Mutohir (1994) with two stages in total. In the first stage, the respondents were gathered in a room and required to write their feelings and psyches on a piece of paper about the indicators of the four dimensions of football referee anxiety. In the second stage, the nominal group process and

the results of the interview became the designated items in the group discussion process. The results of the nominal group process and interviews were categorized into four dimensions of football referee anxiety.

In the next stage, the Q-sort technique was used to select the items. The Q-sort technique was carried out to select items with anxiety symptoms of football referees (Mutohir, 1994) In addition, the Q-sort technique could also collect suitable items according to the anxiety dimension of the football referee. The implementation of the Q-sort technique consisted of; (1) forming a Q-sort group of five lecturers of Syiah Kuala University comprising of two lecturers in the Sports Education Department, two lecturers in Counseling and Guidance Education Department, and a lecturer majoring in education evaluation; (2) providing an explanation of the scope, understanding, and purpose of Q-sort, and (3) determining the items into three categories of importance, namely: "very important", "quite important", and "not important". This stage produced 63 designated items of football referees' anxiety that were considered very important and quite important.

The test of referee anxiety scale was conducted on 30 referees in Aceh Province. The items collected as indicators of symptoms and anxiety disorders obtained from adaptation, interviews, nominal groups, and the selection and categories using Q-Sort became the items used in the test. This test aimed to find out the main dimensions, which consisted of the disorders and symptoms of football referee anxiety. Around 30 referees involved in the trial responded to 63 statements with Likert scoring in the draft of the referee anxiety scale.

Factor analysis to ascertain the validity (dimensionality) scale was conducted to solve problems regarding the main factors that included symptoms and disorders of anxiety according to football referees. This anxiety scale of the football referee was expected to serve as diagnostic feedback, which made the details of the statements to be specific and broad to be able to measure the anxiety disorders and symptoms experienced by football referees when officiating matches. In addition, this football referee anxiety scale was designed in the form of self-reports (Stodolsky, 1985) based on symptoms and disorders as an indication of anxiety.

**Participants**

A total of 13 football referees were involved in the process of collecting and selecting the items for the scale. Meanwhile, five lectures of Syiah Kuala University comprising of lecturers from the Sports Education Department, and Counseling and Education Department were involved in the implementation of Q-sort techniques through Focused Group discussion (FGD). Next, 30 referees from Aceh Province were involved in the scale test by responding to all of the drafted statements that had been collected and selected.

**Data collection**

The Football Referee Anxiety Scale (FRAS) was developed based on four dimensions of individual personality aspects, namely cognitive, affective, somatic, and motoric dimensions (Costin & Draguns, 1989). There were 63 statements on the draft of FRAS consisting of 11 cognitive factor statements, 21 affective factor statements, 18 somatic factor statements, and 13 motoric factor statements. Finally, the scoring process was administered by using the Likert scale.

**Data analysis**

Quantitative data analysis was conducted by employing the Statistical Package for Social Sciences (SPSS) to test the validity, reliability, and factors formed from the statement items of this football referee anxiety scale. To ensure that an instrument measured the intended measurement, it required construct validity. It was obtained by calculating the correlation between the score of each item and the total score subtracted from the item itself. The second essential feature in the development of measurement instruments according to Verducci (1980) was reliability. In this study, the reliability test by using the Alpha Cronbach formula aimed to distinguish the levels of instrument determination. Factor Analysis was one of the approaches to select and reduce the items in this study. Factor analysis is a useful tool for finding correlated and less correlated variables with the items from other clusters (Amir & Syaifuddin, 2017). It is further

explained that the techniques used for the factor analysis were the Principal Axis Factoring and Rotation Method Oblimin with Kaiser Normalization techniques to sort several items into scales. In this study, the factor analysis was conducted to show the level of validity by revealing the number of factors and items that were considered valid to reflect the characteristics of anxiety symptoms and disorders of football referees.

## FINDING AND DISCUSSION

### Finding

The results of the construction validity analysis by calculating the correlation between the score of each item and the total score indicated that 63 items of statements on the draft of FRAS were valid. It can be seen from the fact that each item had a higher correlation coefficient value than the correlation coefficient table ($r > 0.361$). Table 1 shows the summary of the correlation values of each item compared to the correlation value table.

**Table 1. Summary of correlation coefficients**

| Dimension | Items | r value | | r table | Status |
|---|---|---|---|---|---|
| | | (min) | (max) | | |
| Cognitive | 11 | 0.371 | 0.894 | 0.361 | Valid |
| Affective | 21 | 0.406 | 0.752 | | Valid |
| Somatic | 18 | 0.369 | 0.822 | | Valid |
| Motor | 13 | 0.367 | 0.815 | | Valid |

The results of data analysis using the Alpha Cronbach formula showed that four factors had reliability coefficients at $\alpha = 0.74 - 0.76$. It indicated that the reliability of the draft of FRAS was confirmed. The summary of reliability coefficient results can be seen in Table 2.

**Table 2. Summary of the reliability coefficients**

| Dimension | Cognitive | Affective | Somatic | Motor |
|---|---|---|---|---|
| Items | 11 | 12 | 18 | 13 |
| Mean | 78.60 | 146.80 | 123.73 | 89.40 |
| Variance | 41.14 | 92.30 | 67.51 | 43.35 |
| Std dev | 6.41 | 9.61 | 8.21 | 6.58 |
| Case | 63 | 63 | 63 | 63 |
| Rn Alpha | 0.74 | 0.74 | 0.74 | 0.76 |
| Status | Reliable | Reliable | Reliable | Reliable |

KMO and Barlett's Tests were conducted to determine whether the existing variables and samples could be analyzed further. The result of KMO and Barlett's Test was 0.788 with a significance of 0.000. Since the number was above 0.500 and the significance was below 0.050 ($0.000 < 0.050$), the existing variables and samples were able to be analyzed further. The detailed output of the KMO and Barlett's Test results can be seen in Table 3.

**Table 3. Output of the KMO and Bartlett's test results**

| Kaiser-Meycr-Olkin Measure of Sampling Adequacy | | 0.788 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 95.863 |
| | df | 6 |
| | Sig. | 0.000 |

From the analysis results of the anti-image matrices test, a correlation value was obtained based on the value of the factor analysis and determined the factors with feasibility to be used in the follow-up analysis. Four factors consisting of 63 items were significantly charged and included in the targetted factors to be measured. It can be seen from the fact that the factors in the

football referee anxiety scale were correlated although based on the analysis, each factor seemed to measure the dimension of football referees' anxiety in officiating football matches to measure.

**Table 4. Pattern matrix test results**

| No. | Item | Component | | | |
|---|---|---|---|---|---|
| | | Cognitive | Affective | Somatic | Motor |
| 1 | Lack of mastery of the rules | 0.894 | | | |
| 2 | Refusal to officiate | 0.778 | | | |
| 3 | Hesitation to decide | 0.824 | | | |
| 4 | Lack of focus | 0.371 | | | |
| 5 | Unsureness of the decision | 0.551 | | | |
| 6 | Concerns | 0.539 | | | |
| 7 | Difficulty in concentrating | 0.690 | | | |
| 8 | Unability to perform appropriately | 0.488 | | | |
| 9 | Forgetting to blow the whistle | 0.718 | | | |
| 10 | Experiencing confusion | 0.642 | | | |
| 11 | Easily getting irritated | | 0.640 | | |
| 12 | Easily getting angry | | 0.749 | | |
| 13 | Feeling pessimistic | | 0.752 | | |
| 14 | Lack of confidence | | 0.536 | | |
| 15 | Panic | | 0.614 | | |
| 16 | Less consistency | | 0.533 | | |
| 17 | Nervousness | | 0.565 | | |
| 18 | Being sensitive | | 0.564 | | |
| 19 | Haste | | 0.581 | | |
| 20 | Being afraid of making decisions | | 0.419 | | |
| 21 | Being afraid that the match does not run | | 0.560 | | |
| 22 | Being afraid of being protested | | 0.406 | | |
| 23 | Being afraid in giving rules | | 0.634 | | |
| 24 | Being afraid of being unable to finish the match | | 0.663 | | |
| 25 | Daydreaming | | 0.614 | | |
| 26 | Restlessness | | 0.572 | | |
| 27 | Feeling threatened | | 0.617 | | |
| 28 | Tremble | | | 0.689 | |
| 29 | Heart rate palpitations | | | 0.670 | |
| 30 | Shortness of breath | | | 0.575 | |
| 31 | Dizziness | | | 0.562 | |
| 32 | Dim vision | | | 0.821 | |
| 33 | Insomnia | | | 0.369 | |
| 34 | Nausea | | | 0.749 | |
| 35 | Dry throat | | | 0.505 | |
| 36 | Pale face | | | 0.505 | |
| 37 | Pain in the chest | | | 0.762 | |
| 38 | Pain in the legs | | | 0.520 | |
| 39 | Pain in the arms | | | 0.420 | |
| 40 | Numb legs | | | 0.822 | |
| 41 | Limp body | | | 0.650 | |
| 42 | Red eyes | | | 0.677 | |
| 43 | Frequent urination | | | 0.606 | |
| 44 | Cold hands | | | 0.416 | |
| 45 | Difficulty to run | | | | 0.636 |
| 46 | Difficulty to blow the whistle | | | | 0.728 |
| 47 | Stiff tongue | | | | 0.596 |
| 48 | Stiff legs | | | | 0.635 |
| 49 | Cramp legs | | | | 0.430 |
| 50 | Frequent blink | | | | 0.730 |
| 51 | Heavy legs | | | | 0.815 |

Based on the item spread across four dimensions in the football referee anxiety scale, factor analysis was conducted to 63 items, and after it was conducted several times, only 51 items were found to have a factor load greater than 0.30 in the pattern matrix. The items with the factor load smaller than 0.30 were aborted. The 51 final items used for the football referee anxiety scale comprising 10 items of cognitive factors, 17 items of affective factor, 17 items of somatic factors, and 7 items of motoric factors as presented in Table 4.

**Discussion**

Football referees often experience intimidation and intervention from players, coaches, and officials sitting on the bench during matches. The role of the referee is crucial during the match, especially the middle referee. However, the role of the linesman is as risky as the main referee. For example, the decision of foul and offside becomes crucial if there is no common perception between the middle referee and the linesman when they are required to make a quick decision during the game. These are among the reasons that lead to the emergence of VAR (Video Assistance Referee) on the pitch (Carlos, Ezequiel, & Anton, 2019). Unfortunately, VAR could not be applied in the Indonesian football, especially in First League (*Liga* 1), Second League (*Liga* 2), and Third League (*Liga* 3). Regardless of the amount of fund incurred by the match committees, the tool was considered not ready and required a long duration of the training. Besides, it was due to the ability of the match instrument itself. Therefore, the development of instrument was needed to discover various challenges experienced by all football referees when officiating the match. The development of the FRAS was one of the innovations that could be offered to overcome this challenge. The main purpose of this development was to deal with various challenges regarding the intervention and intimidation during the match.

In the professional football context, stakeholders need to be aware of the various symptoms of mental disorders that might be experienced by the referees when officiating matches. This issue should be prioritized since the challenges to seek help in discovering the symptoms of mental disorder in elite sport include the stigma and the lack of information (Gulliver, Griffiths, & Christensen, 2012). A previous research on professional football referees reported that symptoms of mental disorders could negatively affect the referee's performance, but only 18% of them needed medical help for the symptoms of mental disorders they experienced (Gouttebarge et al., 2017). The study also showed that the impaired effectiveness of the referee's performance due to mental disorders such as: feeling irritated, sensitive, pessimistic, less confident, threatened, inconsistent, nervous, and afraid of being protested, giving rules, being unable to finish the match, making decisions, failing to run the match. The others are frequent daydreaming, fidgeting, panicking, and showing haste. Grounding on these issues, most professional football referees state that there need to be support measures to develop specific measurements and adapt to the needs in managing the symptoms of mental disorders. The needs of professional football referees should be assessed and considered for the development of implementation measures to take control of mental health (Castillo-Rodríguez et al., 2021; Sors et al., 2019). There should be innovations in e-Health-based interventions developed by FIFA which are available online due to the symptoms of mental disorders that are frequently noticeable and not considered taboo. Considering the need for a psychological management approach to football referees, it may be necessary to monitor and manage the symptoms of mental disorders and their impacts on the referee's performance, emotions, and quality of life. Moreover, another intervention for referees is needed by creating group trainings regarding motivational/emotional stress management, and the referee's confidence under pressure (Gouttebarge et al., 2017). Therefore, the results of the scale developed in this study are considered in line with the referee's needs and the problems they experienced currently.

In addition, considering the multidimensional aspects required by a scale to distinguish the aspects of football referee anxiety, this developed scale consisted of cognitive, affective, somatic, and motoric dimensions. From the perspective of the motoric aspect, this study indicated that referees commonly had troubles in running, blowing whistles besides experiencing stiff tongues, stiff legs, cramped legs, excessive blinking, and heavy legs during the match. This result was in accordance with the previous research that stated the referee's health condition might be one of

the factors causing motor disorders during matches (Bambaeichi et al., 2010), which still needed to be improved. This exploration study discovered several physiological symptoms experienced by referees, including shaking, heart rate palpitations, shortness of breath, dizziness, lightheadedness, insomnia, nausea, dry throat, pale face, numb legs, limp body, reddish eyes, frequent urination, cold hands as well as pain in the chest, legs, and arms. Although it was undeniable that according to the results of cognitive measurements, referees subjectively admitted if they sometimes lacked mastery of the rules, refused to officiate, hesitated to make decisions, lacked focus and confidence with their own decisions, worried, failed to concentrate and show appropriate performances, forgetted to blow the whistle, and get confused. This result was in line with a research showing that there is a very significant positive relationship between anxiety and confidence in officiating matches (Hoseini et al., 2011). Therefore, it was evident that the experience of a referee in officiating matches becomes a determining factor of the referee's performance on the pitch (A. Castillo-Rodríguez et al., 2021) although it was observed that there were no significant differences between the factor of referee's stress frequency and the level of education possessed by the referees (Mirjamali et al., 2012).

This study has produced an anxiety scale of football referees consisting of four factors in 51 points with high validity and reliability. The football referee anxiety scale developed in this study had a good reliability of internal theta consistency because (1) theta's internal consistency reliability was relatively higher than that of alpha and omega since both reliabilities were the lower threshold reliability; and (2) theta reliability was a special case, used to maximize the alpha coefficient. Furthermore, the factor analysis using the confirmatory approach estimated the relationship of four factors that were revealed to have a multivariate normal distribution and that the reliability of internal consistency theta was used, so it can be said that 51 statements in the four factors in the football referee anxiety measuring tool significantly contributed to the indicator. This scale was developed by adapting the conditions in Indonesia where the VAR technology has not been implemented (Tamir & Bar-eli, 2021) because when looked closer at the court, this technology is significantly helpful and strengthens the referee's mentality in making decisions (Spitz et al., 2021) although many people argue that it damages the course of the match and intersects with the loss of artistic value in football. In addition, another technology named simulator which specifically overcome the decision-making problems for the referees emerged (Samuel et al., 2019).

On the other hand, many studies focused more on the relationship between players and the anxiety that was potential to intervene and intimidate the referees. The players who were accustomed to doing group motion assignments, especially amateur football players, could possess relatively lower anxiety compared to amateur players who have never been given group motion assignments (Oh & Gill, 2017). The players also experienced a similar issue with decision-making in passing or shooting, while the referee had to deal with decision-making in determining whether the incident was a foul, whether the ball was offside, and whether a yellow or red card should be given. Decision-making mistakes on players can determine the final result of the match (De Sousa Fortes et al., 2018). For instance, when the players make a passing error and lead to a counterattack at the last minutes and cause the winning goal for the opposing team, self-control is needed not only by the referee but also the player as the main character on the pitch while the referee servesd as a judge on the pitch. Another factor that was not less important was the ability of motivation (Gardner et al., 2015), both internal and external, which could anticipate and control anxiety (Samuel et al., 2019). Although there was a discussion revealing that considerations of the referees' idealism in decision-making, the direction of anxiety still needed to be further studied (Louvet et al., 2015). A doable action to reduce athletes' anxiety includes guided imagery exercises (Abiş et al., 2021), which is confirmed to be effective in dealing with anxiety in tennis (Fekih et al., 2021) and swimmers (Lin et al., 2021), followed by self-hypnosis (Mukhopadhyay, 2021).

A study explained how a decision-making simulation affected the referee's mentality, and it was applied to the simulation test when the ball was offside in a match situation, various violations, and the decision to give yellow or red card (Johansen & Haugen, 2013). It was observed that the improved accuracy of decision-making occurred in the 30-45 minutes of the

match. In addition, during the last 15 minutes of the match, where many crucial incidents occurred and could determine the result of the match, the sensitivity of the referee was highly demanded and needed to be accounted for. Due to these reasons, self-control becomes the main factor related to the accuracy of referee decision-making (Samuel et al., 2019). A comparison of experience as a national and amateur referee (Castillo-Rodríguez et al., 2021) becomes potential in the referee's self-control (Samuel et al., 2019), amateur football referees always encounter stressful situations during matches, whose control is related to the physiological response produced during the competitions. Therefore, referees with lower stress control require a greater physiological response during the competition, which leads to decisions with a high level of exhaustion consideration (Castillo-Rodríguez et al., 2021). These findings may advise football referees to supplement the training with psychological intervention programs to improve stress control. In addition, a unique study simulated the referees' performances during matches observed by club officials and sporting bodies in stadiums and matches supervisors as an addition. The results showed that the number of important and countless spectators did not provide a significant difference compared to the small number of spectators (Hoseini et al., 2011). However, it appeared to be inversely proportional to the results of research in basketball, in which the external factors such as noise or shouts of the crowd were found to greatly affect the referee's decision-making on the court (Sors et al., 2019).

The referees' experience when officiating a match was certainly influenced by many factors, including what had been investigated in this study where cognitive, affective, somatic, and motoric factors appeared to be determinants in the process of decision making on the court. The results of this study were in accordance with the previous studies that emphasized the determinants that belonged to self-control ability (Samuel et al., 2019), and the experience of officiating matches while they were on duty (Castillo-Rodríguez et al., 2021) A major finding of a study reported that the prevalence of mental health symptoms (self-reported and not clinically diagnosed) among professional football referees ranged from 6% for stress to 31% for eating disorders, and 8% for consuming alcohol and 29% of referees suffering from eating disorders during one season incidents. The mental health symptoms can negatively affect the referees' performances (Gouttebarge et al., 2017). The relationship between stress syndrome, anxiety, and social support in referees was tracked down, and it showed a potential burnout of 2.44%. Although, in general, there was no statistical significance found in the dimensions of burnout syndrome (the lead or assistant referee) and the referees' experience, there was a tendency to occur to the head referees from the highest statuses of the competition (Pedrosa & García-Cueto, 2016). Finally, the correlation between stress, anxiety, and social support was confirmed to potentially afflict the refereeing group at a higher level (Castillo-Rodríguez et al., 2021).

In addition, adopting from a study on basketball referees, because more than one referee officiated the matches, where commonly around three to four referees, a synergy or equality of perception and cooperation between the referees are needed (García-Santos et al., 2017) in making decisions against the offside balls, violations and card giving to avoid biased decision making due to pressure from the spectators (Sors et al., 2019), especially when intervention came from the temperamental behaviors of the athletes, push the referees, and harsh words, which make the objective to minimize any potential commotion and fights during football matches could not be achieved and it would be more likely tarnishing the values of sportsmanship and mutual respect. Previous studies revealed several problems experienced by referees and professional athletes, including severe musculoskeletal injuries, lack of social support, and unpleasant personal life issues associated with potential symptoms of mental health (Gouttebarge et al., 2015, 2016). Professional football referees reported that the development of special support measures for them was needed to properly manage stress and mental health symptoms (Gouttebarge et al., 2017). Although there has been an innovation in the use of EEG (Electroencephalography) technology, studies showed that slow EEG could predict anxiety formation and appeared to reflect defensive inhibition mechanisms to anxiety in the prefrontal cortex (Sultanov & İsmailova, 2019). The implementation of a portable EEG system could provide efficient and valid predictors of the emotional state that could be implemented not only for football players but also for the referees.

## CONCLUSION

The results of this study showed that the FRAS consisting of 4 factors and 51 points had a high level of validity and reliability and was able to measure the anxiety of football referees while officiating a match. Anxiety is a symptom of mental disorders that can affect the referees' performance in refereeing in a court. The situation and condition of the Indonesian national football, in which the intervention and intimidation often occurred directly and indirectly from players, coaches, officials, and spectators, were found to greatly affect the anxiety level of the referees on duty. Therefore, this FRAS could be used as an initial investigation instrument of the referee's readiness to officiate the match. This FRAS has been tested limitedly on the referees in Aceh Province, which makes it necessary for a wider trial involving the referees at the national and iinternational levels.

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