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Greek Basketball Referees Performance and Stress Factors During and After the Games

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Abstract

The purpose of this study was to evaluate the level of pre-competitive anxiety experienced by N=348 Greek basketball referees. In order to classify the stress factors Competitive State Anxiety Inventory-2 (CSAI-2) used. The aim was to examine Cognitive state anxiety, Somatic state anxiety, and Self-confidence, which require them to exercise self-control for optimal performance before and after the games. Results indicated that cognitive and somatic anxiety after the event was higher. On the other hand, self-confident decreased. Confirmatory factor analysis showed that referees' competitive anxiety might affect their fear of mistakes before a stressful game.

Keywords: Stress, Basketball, Referee, Performance

Introduction

Being a successful athlete, coach, or referee requires more than just practising your technical skills at a demanded level. This is why theory and methodology in sports suggest that every athlete, coach or referee needs optimal preparation not only physically and technically but psychologically as well. Referees are consistently subjected to a wide range of potential stressors, such as physiological, psychological and physical Wolfson and Neave, (2007). According to Helsen and Bultynck (2004), each referee typically makes 137 observable interventions in a single game.This responsibility can be clearly associated with the psychological demands of the game.One mistake from the referee can lead to the loss of economic and social perspective for the team, players, and fans Guillen (2003).

Therefore, the research has supported that psychological preparation is an essential component for every athlete's successful performance Vealey (2007).Successful football referees have an excellent ability to cope with psychological pressure as their tasks are demanding, and they require performing under stress and pressure Guillen and Feltz,(2011). For instance, during the game, in order to achieve their optimum performance and become successful, referees must be psychologically prepared to cope with stress and anxiety. This will help them stay focused and calm, control their emotions, and manage their self-confidence Mathers and Brodie, (2011).

Inorder to identify the needs competencies for Greek track and field coaches, Stavropoulos et al., (2012) investigate that the successful track and field coaches should have the core competences such as field management techniques, sport science, biology, injury prevention/risk management and field training.

Anxiety has been measured by many sport psychologists, as it is one of the most controversial psychological topics. It is defined as a negative emotional state with feelings of nervousness, worry, and apprehension associated with the body's activation or arousal. Moreover, Spielberger, (1966) separated anxiety in state and trait anxiety. State anxiety is a temporary, ever-changing emotional state of subjective, consciously perceived feelings of apprehension and tension, associated with activation of the autonomous nervous system. In contrast, trait anxiety is a behavioural disposition to perceive objectively non-dangerous circumstances as threatening with disproportionate levels state anxiety. Martens et al., (1990) proposed a series of two-dimensional relationships between cognitive anxiety, somatic anxiety, self-confidence and performance.

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They define competitive anxiety as conscious feelings of apprehension and tension due mainly to the athlete's perception of the present of upcoming situations as threatening. Most athletes face anxiety as a negative emotion as it can worsen performance Duda, (1998). Furthermore, coaching is a cognitive improvisation, a set of flexible rules and experiences that alter in time and situation and prove-right from the results Papailiou et al., (2015).

Cognitive anxiety contains negative thoughts and self-doubts about performance that manifest themselves in the participant, whereas Somatic Anxiety (physiological component) contains the body that responds by increasing heart rate, sweating, feeling sick, butterflies etc. Somatic anxiety is an individual's perception of their physiological state. Since anxiety is a negative emotion, researchers tend to focus on the negative effects on performance Hanton et al., (2006). However, under some mechanism, anxiety might positively affect a performer's psychological state and affect athletic performance. Several scales designed to measure the anxiety construct, such as Sport Competition Anxiety Test (SCAT) Martens, (1977), Self-rated Anxiety Scale(SAS)Smith et al., (1990) and the Competitive State Anxiety Inventory-2 (CSAI-2) Martens et al., (1990), which is the most frequently used questionnaire. CSAI-2 have subsequently been modified to assess both the intensity and directional interpretation of the competitive anxiety response. These developments provided the catalyst for research exploring the effect of individual differences in variables including skill level (e.g., Jones, Hanton &Swain, 1994), sport type, e.g., Hanton, et al., (2000), and gender (e.g., Perry & Williams, 1998) on anxiety interpretation. CSAI-2 inventory has been used in many studies in order to measure the anxiety of athletes and referees.Zisis et al., (2020) was examined the effects of competitive anxiety. Ninety-two football referees were used. They found that results showed that men referees had less cognitive and somatic anxiety than women, in contrast to confidence, which was higher in men than women.

In general, being a referee can produce an increased amount of stress as well as physical illness or stress symptoms (Fucini, 1979; Gait et al.,1979; Rotella et al., 1985; Zoeller, 1985). Taylor and Daniel (1987) have found that stress can lead to loss of attention and focus and thus, decrease performance, as the referee to become more introvert. Taylor and Daniel (1987), developed the Soccer Officials Stress Survey in order to measure the perceived types of stressors among soccer referees. They found that soccer officials experience most of their stress because of their fear of failure. Then, Taylor et al., (1990) used the Ontario Soccer Officials Survey which was a revised form of SOSS, and they investigated that burnout among referees was related to stress from fear of failure, interpersonal conflict, role culture conflict.

According to Bruke et al., (2000), high school and college basketball referees showed that they were experiencing significantly less anxiety after a game when compared to before the game. Also, in terms of negative thinking, referees showed that they were experiencing moderate levels of negative thoughts, including thoughts of failure and making mistakes (Lindsley. W., 2011). Furthermore, according to Kaissidis and Anshel (1993) young Basketball referees were more stressed than older referees. There are limited studies on measuring competitive anxiety and self-confidence in Greece and Cyprus, especially on referees. The following study aims to examine factors of the Cognitive state anxiety, Somatic state anxiety and Self-confidence, which require referees to exercise self-control for optimal performance before and after the games.

Methods

This questionnaire contains information on the participant's age, gender, race, years of experience, level of official, and the highest level of game officiated. We used the theoretical model of the Competitive State Anxiety Inventor-2 (CSAI-2) developed by (Martens et al. 1990), CSAI-2, a general sports anxiety style questionnaire. Referees complete the following scale on two separate occasions: during a quiet time before starting the game when they are fairly relaxed. During a competitive situation, you feel highly stressful. The instrument was edited based on the group of experts' feedbacks. If items were identified as valid by experts in a percentage of 75%, were kept. Based on the English translation of the questionnaire into Greek, the researchers and a bilingual editor confirmed all items and expressions conform to proper use in both adaptations. After the structural equation model test, the instrument is measuring the five main variables. Furthermore, we used factor analysis to be grouping the variables that are considered to describe the referee's anxiety during a stressful game.

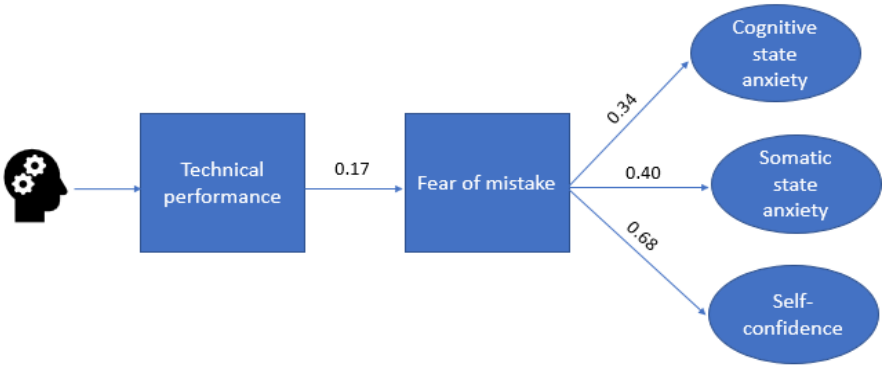
This study employed a hand-delivered survey methodology to determine the type of anxiety in Greek professional basketball referees. Furthermore, the hand-delivery method provides a greater response rate compared to mail back and offers an opportunity for face-to-face interaction with participants. Data were analysedutilising Statistical Package for Social Science (SPSS) and SPSS Amos as well. Quantitative questionnaires

covered the field of anxiety and were utilised to collect the data by 5-point Likert scales that were used to evaluate fundamental variables by self-reported measures. The data analyses were based on the 348 returned questionnaires that were fully completed.

Participants in the study consisted of 326 (93,6%) male referees and 22 (6,4%) women referees. Additionally, mediator scales were used to define the measurement under each variable sub-dimension.According to the literature, the proposed model (Figure 1) shows the suggested interactions by the mediation role of the fear of mistake to theanxiety factors between and during the basketball event. All the hypothesised variables are displayed in the above-mentioned model, which critically investigates the following hypotheses:

H1: Technical performance positively influence fear of mistake
H2: Fear of mistake positively influences cognitive state anxiety
H3: Fear of mistake positively influences stomatic state anxiety
H4: Fear of mistake positively influence self-confidence

Figure 1: SEM Stress factor evaluation model



Results

Table 1 shows the mean and standard deviation for the variables before and after the matches. The mean of cognitive anxiety after stressful games (M=22.6, ±0.21) is higher than the mean of cognitive anxiety before stressful games (M=17.1, ±0.16). Moreover, the mean of somatic anxiety after the games (M=22.1, ±0.14) is higher than the mean of somatic anxiety before the games (M=14, ±0.14). Similarly, the mean of self-confidence after the games (M=19.5, ±0.07) is less than the mean of self-confidence before the games (M=23.6, ±0.33). Additionally, in Table 1, referees' cognitive anxiety and self-confidence before play and after play have a significant difference, and considering this means we can conclude that somatic anxiety after the game is higher than before the game.

Table 1: Mean and standard deviation before and after the games.

Variable	***Before a stressful game***		***After a stressful game***	
	Mean	SD	Mean	SD
Cognitive state anxiety	17.1	0.16	22.6	0.21
Somatic state anxiety	14	0.14	22.1	0.14
Self-confidence	23.6	0.33	19.5	0.07

According to findings, coefficients of correlation between the data based on three sets of variables: (1) correlations between the factors of anxiety before and after the matches; (2) examining which of the factors affect referees; and (3) how personal psychological characteristics of referees have affected to the anxiety during the game.Correlations between Cognitive state anxiety and Self-confidence were not highly correlated ($r = 0.380$; $P < 0.01$), and Somatic state anxiety was moderately andsignificantly correlated with Cognitive state anxiety ($r = 0.210$, $P < 0.01$). Similarly, Self-confidence was also moderately but significantly correlated with somatic state anxiety ($r = 0.327$, $P < 0.01$). Additionally, the correlations between Cognitive state anxiety and Self-confidence is less

statistically significant after the matches (r = 0.120; P < 0.05), and Somatic state anxiety was negative, correlated with Cognitive state anxiety (r = -0.066, P > 0.01).

Table 2 Correlations between cognitive, somatic anxiety and self-confidence anxiet during and after the games.

Variable	*Cognitive state anxiety*	*Somatic state anxiety*	*Self-confidence*	*Cognitive state anxiety*	*Somatic state anxiety*	*Self-confidence*
Cognitive state anxiety	1	0.210**	0.380**	1	-0.066	-0.120*
Somatic state anxiety	0.210**	1	0.327**	-0.066	1	-0.052
Self-confidence	0.380**	0.327**	1	0.120*	-0.052	1

3.1 Exploratory factor analysis

Exploratory factor analysis (EFA) was conducted to examine the stressful factor structure that the scale will reveal from the data obtained from the Greece professional referees.Conformity of the data for the factor analysis was examined through the Kaiser-Meyer-Olkin (KMO) coefficient and Barlett's test of sphericity. For chi-square value calculated with Barlett's test of sphericity is required to be statistically significant.(KMO) Sample Conformity coefficient was calculated as 0.871 and (p<.001). The finding indicates that data are conformable to factor analysis and scores are normal.

Analyses presented a single factor structure with a 10.76 eigenvalue that explains 76.88% of the total variance. Factor loadings ranged between 0.428 and 0.915 respectively. Detailed factor loads of the scale are presented in Table 3. Cronbach's alpha internal consistency method was used to test Basketball referees' reliability, and decision satisfaction scale. Research findings show that can describe basketball referees' decision satisfaction levels serving in Greek professional categories.

Table 3: Results of the explanatory factor analysis and a load factor of the variables

Variables	*Fear of mistake*	*Pressure from Coaches and Players*	*Technical performance*
The sensitivity of judgment of popular teams	0.849		
Judging important and sensitive games	0.915		
Making sensitive decisions during the game	0.866		
Effects of radio and T.V. broadcasting during the match	0.711		
Working with other referees during the game	0.792		
Verbal pressure of the players during the match		0.801	
Verbal pressure of the coaches during the match		0.760	
Aggressive behaviours of fans		0.428	
Lack of cooperation between the coaches and players during the judgment		0.855	
Threatening referees		0.760	
Wrong Personal foul decision			0.835
Wrong Technical foul decision			0.738
Wrong Unsportsmanlike foul decision			0.873
Being in the wrong location when making a call			0.567
Eigenvalues	10.76		
Total variance	76.88%		

The exploratory factor analysis results from 14 questions indicated that the referees' stressful factors could be classified into three stressful factors. Explanatory factor analysis showed that five questions of fear of mistake scale have factor loadings varied from 0.711 to 0.915, which is accepted for our sample size.

Moreover, EFA analysis showed that five questions of pressure from coaches and players scale have factor variation of 19.96% of the data's variability. The factor loadings varied from 0.428 to 0.855, which is accepted for our sample size. Finally, the technical performance four questions have factor loading from 0.567 to 0.873 with factor variation of 31,6%.

3.2 Confirmatory factor analysis (CFA)

Regression analysis investigated that technical performance as a factor is statistically significant both for Cognitive, Somatic, and Self-Confidence anxiety. Confirmatory factor analysis is a validity determination method used to adapt measuring tools developed in other cultures and samples (Dogan, 2010). The acceptable fit value for CFI, NFI, and IFI indexes is 0.90, and the perfect fit value is accepted as 0.95 (Bentler, 1980). Additionally, for RMSEA the proper fit is 0.08, and the ideal fit value is 0.05. Fit index values for the present study are: RMSEA=0.112, CFI=0.92, GFI=0.90 Fit index values for the model formed for the whole sample are as follows; χ^2/ df value is under three which indicates an acceptable fit. As a result, these fit indexes show that the model has a good fit.

Conclusion

The investigated model is presented in (Figure 1) and results pointed out that fear of mistake affected significantly by technical performance; b=0.172, p<.001. Furthermore, cognitive state anxiety significantly affects fear of mistake b=0.344, p<.001; somatic state anxiety isinfluenced considerably by fear of mistake b=0.398, p<.001, and self-confidence rapidly increased when the fear of mistake is lower b=0.681, p<.001. Expressly, exploratory factor analysis results indicated that Greek professional basketball referees' stressful factors could be classified into three factors; fear of mistake, pressure from coaches or players, and referee's technical performance. Furthermore, based on confirmatory factor analysis, technical performance affects directly and statistically significant fear of mistake, affecting cognitive, somatic anxiety, and self-confidence. Adding achievement orientations to the equation in the structural model extends a conceptual framework and allows additional referee efficacy sources within the framework. Limitations of this study include the use of cross-sectional data in the mediation analyses. Based on that, precludes definitive conclusions about whether the included predictors precede referee self-efficacy as mediators and, in turn, influence affective states as outcomes.Additionally, conducting studies with an intervention control group design would help to test the sensitivity of the referee's scale in intervention programs intended to enhance referee self-efficacy among this important and often neglected group of people in the sports world.

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