ORIGINAL ARTICLE

Development and validation of the evaluation and selection criteria scale for coaches: Factor structure, validity and reliability

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ABSTRACT

The purpose of this study was to develop and provide initial validation of a scale designed to identify the evaluation and selection criteria of 585 coaches selected to work in 237 amateur sports clubs in Attica, Greece. The development of the scale was based on the job analysis of coaching and the review of the evaluation of coaching performance. The criterion of KMO (.934) and Bartlett's test of Sphericity test (13338.366, df 406, $p < .00001$) confirmed that the requirements for factor analysis were met. EFA revealed a scale of 29 items and identified six (6) factors interpreting the 73.396% of the overall variance: (1) results of coaching on athletes, (2) personal achievements of the coach, (3) design and implementation of coaching (4) competition management (5) psychological support of the athletes and (6) commitment to the club. CFA was used to test the accuracy of the construct revealed by EFA. The findings of this study support the factorial structure of the scale and its psychometric qualities in a Greek sample suggesting that the scale is valid for identifying the evaluation and selection criteria employed from amateur sports clubs to select their coaches.
Keywords: Sports coaching, Amateur sports clubs, Selection process.

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INTRODUCTION

Selecting a coach is an extremely important decision for a sports club; coaches contribute critically to the fulfilment of strategic organizational goals and their performance constitutes a potential source of growth as well as a significant competitive advantage (Armstrong & Taylor, 2023; Davis et al., 2022; Millar, Clutterbuck & Doherty, 2020; Taylor, Doherty & McGraw, 2015). Selection is the part of the recruitment process that refers to the decision of the applicant that will be appointed to a job position (Armstrong & Taylor, 2023). Literature suggests that effective recruitment and selection of personnel in sports organizations requires accurate analysis of the job position (Taylor, et al., 2015). Therefore, job analysis of the coaching work is a prerequisite for describing coaching tasks and specify requirements for their successful accomplishment as well as for generating selection criteria for a specific coaching position.

Coaching is recognized as a complex and behavioural dynamic work which is organized situationally in accordance to a given setting, environment or context (Cooper & Allen, 2018; Corsby, 2024; Gershkowitz et al., 2021; Lara-Bercial & Mallett, 2016; O'Boyle, 2014; Zhang et al., 2018). The coaching context represents the environment in which coaching is situated and includes in addition to the location, the nature and type of the sport, the age and competition level of the athletes, cultural and individual characteristics of those involved, the needs of the athletes (Cushion, Harvey, Muir & Nelson, 2012; Horton, 2015; Lyle, 2002; North, 2009). Therefore, coaching tasks, responsibilities, and functions vary significantly as the context in which coaching is referred (Lyle, 2002; Horton, 2015). However, regardless of the context and the coaching domain, coaches engage in functions that are common in all coaching positions and relate to strategic, instructional, organizational, and social relationship aspects of coaching. These functions refer to (1) setting the vision and strategy of the coaching process, (2) shaping the environment in which coaching occurs, (3) building relationships with athletes and others associated with coaching, (4) conducting coaching practices and preparing and managing competitions promoting learning and improvement, (5) reading and reacting to the field, observing and responding to emerging events, including field related and non-related matters (6) reflecting and learning during each practice and competition and continually seeking for improvement (Lara-Bercial, North, Hämäläinen, Oltmanns, Minkhorst, & Petrovic, 2017).

The successful accomplishment of the above-mentioned coaching functions requires a combination of general and sport-specific knowledge as well as an understanding of the coaching environment (Neelis, Faucett, & Thompson, 2020; Stodter & Cushion, 2019). Specific knowledge is referred to: (a) knowledge in the professional domain, such as knowledge in sports science, knowledge of the sport, and knowledge of pedagogy, (b) knowledge in the interpersonal domain, which concerns communication knowledge, and (c) knowledge in the intrapersonal area, such as self-awareness and reflection (Gilbert & Côté, 2013; Neelis, Faucett, & Thompson, 2020). Knowledge in these three areas is considered required for every coaching position, in a blend that differs according to the coaching domain and the level of the coaching position while the way this knowledge is used relates to success in coaching (Côté & Gilbert, 2009; Stewart et al. 2020). Effective coaching requires also qualities, skills, and characteristics of the coach that ensure the successful accomplishment of duties in every coaching domain. In this sense, coaching professional experience is considered fundamental for the development of coaching knowledge and skills to the extent that coaching expertise cannot be acquired in the absence of experience (Chan & Mallet, 2011; Kramers et al., 2020; Lyle & Cushion, 2017; Neelis, Faucett, & Thompson, 2020). Literature supports that the more experienced a coach is and the greater the diversity of their experiences, the faster the coach learns and improves coaching skills (Schempp, McCullick & Mason, 2006). In addition, skills that facilitate communication and interaction with other people are considered very important in coaching as at the centre of the coaching process is placed the coach-athlete relationship the quality of which affects coaching effectiveness and mediates leadership

(Côté & Gilbert, 2009; Horn, 2008; Jowett, 2017; Jowett & Arthur, 2019; Martens, 2012; MacLean & Chelladurai, 1995; Rhind & Jowett; 2010; Sullivan, Rhind & Jowett, 2014). Leadership, in particular, is the behaviour aimed at increasing or influencing athletes' performance and satisfaction. Pedagogical, organizational, and administrative skills are also necessary for sports coaching (Cassidy et al., 2023) as they facilitate effectiveness in shaping a welcoming, positive, inclusive, and safe training environment (Perkins & Hahn, 2019). Critical thinking, reflection, autonomy, adaptability, decision-making, and needs analysis, are some of the abilities that relate to personality and facilitate the application of theory in practice ensuring the successful fulfilment of the coaching roles (Lara-Bercial, Duffy, & Harrington, 2013). Therefore, personality which refers to a person's characteristics as well as leadership skills are considered very important in coaching as they facilitate interpersonal relationships and have a significant impact on athletes' performance (Amorose & Horn, 2001; Mageau & Vallerand, 2003; Martens, 2012; Predoiu et al., 2021; Vella, Oades, & Crowe, 2010).

Coaching performance is an extensively researched topic in sports literature. While traditional coaching performance evaluation focused on results, records, victories, and medal winnings to assess the performance of a coach research has shown that the objective measurement of coaching performance rely on criteria that are exclusively linked to the coaching work (job-specific), result from the study of the coaching behaviours required to fulfil the coaching tasks and differ depending on the coaching field or the context in which the training practice is situated and the coach-athlete relationship operates (Côté, Salmela, Trudel, Baria, & Russell, 1995; Horn, 2008; Lyle & Cushion, 2017; MacLean & Chelladurai, 1995; Behrendt, & Greif, 2022). Nevertheless, according to some authors (Côté & Gilbert, 2009) athletes' performance and achievement levels in addition to the level of their satisfaction and enjoyment are factors measuring coaching performance.

In occupations like coaching, work behaviours are considered central to job performance as they influence important aspects of athletes' development and their overall sporting experience (Thelwell et al. 2017; Smith & Smoll, 2017). As a result, an ongoing debate has been stimulated concerning the evaluation of coaching performance raising questions whether the evaluation criteria should refer to the results of the coaching intervention, the evaluation of the coaching behaviours, or both. The work of MacLean & Chelladurai (1995) supported that the evaluation criteria of coaching performance should be task-specific, measurable elements of the task and result from the study of coaching behaviours that are context specific (MacLean, 2001). Extending this work, MacLean and Zakrajsek (1996) proposed a set of job performance criteria of coaches in the context of Canadian collegiate sports that includes the coaching behaviours associated with results either for the coach or the athlete, behaviours related directly or indirectly with the coaching task and behaviours that relate to administrative tasks and public relations. Coaching behaviours were at the centre of the focus and analysis of several models developed to provide a comprehensive understanding of the coaching process and to determine the criteria appropriate to evaluate coaching performance (Lyle, 2002). From another point of view, Zhang, Hou, Wang & Xiao (2014) argued that a coach's evaluation concerns personal abilities, coaching abilities and athletes' results.

Coaching is a contextual process and therefore coaching performance should be evaluated in relation to its context (Corsby, 2024; Horton, 2015; Lyle, 2002; Lyle & Cushion, 2017). As such, coaching performance criteria should include contextual characteristics as they shape and influence constantly the roles and the responsibilities of the coach. However, successful evaluation of the performance of a coach depends on the definition of appropriate criteria (MacLean, 2017; MacLean & Chelladurai, 1995).

In the context of amateur sports, the selection decision of a coach relies on the club's executive board members who are volunteers and usually adopt less formal and less structured recruitment and selection

procedures for their coaches (Papadimitriou, 2005; Taylor, et al., 2015). Given that selection of coaches refers to decisions made by club administrators which, most of the times, are based on intuition, personal rapport or experience the present study aims to develop and assess the psychometric properties of the Evaluation and Selection Criteria (ESC) scale in order to identify the evaluation and selection criteria of coaches working for amateur sports clubs. Furthermore, the study aims to validate the measurement model of the evaluation and selection criteria in the context of the Greek amateur sports clubs among the population of coaches working in the area of Attica. In a context where informal personnel selection processes are usually employed this study aims to offer a comprehensive and easy-to-use tool for the evaluation and selection of coaches and to raise attention to issues regarding recruitment and selection procedures.

MATERIAL & METHODS

Participants

The sample comprised five hundred eighty-five (N = 585) coaches selected by three hundred fifty-three (353) administrators to work in two hundred thirty-seven (237) local amateur sports clubs. Participants were selected using a simple random sampling method among the coaches working in amateur sports clubs in the Region of Attica, Greece. Demographics showed that 393 coaches were male (67,2%) while 192 were female (32.8%). The age of the coaches ranged from 18 to 69 years (M = 40.2, SD = 10.28) and their working experience ranged from 0 to 50 years (M = 14.2, SD = 8.71). Most coaches (432, 73.8%) had a university degree. 514 (87.9%) coaches had a professional license in coaching and 542 (92.6%) had a previous experience as athletes before becoming coaches. Sport coaching was the main profession of 267 (45.6%) coaches while 318 (54.4%) coaches had other than coaching as their primary occupation. The majority of the coaches in the sample (508, 86.8%) were coaches working from 1 to 35 years in the same sports club while 77 (13.2%) were new recruits. In addition, demographic data showed that 491 (83.9%) coaches were part-time employees while 94 of those were working full-time in the club. Coaches under this study covered thirty-one sports: tennis (27), weightlifting (8), gymnastics for all (9), gymnastics (17), table tennis (4), jiu jitsu (15), sailing (11), basketball (78), artistic swimming (6), aerobic gymnastics (2), canoe kayak (1), karate (13), swimming (63), rowing (2), modern pentathlon (4), muay tai (1), fencing (4), wrestling (1), volleyball (70), cycling (2), soccer (71), boxing (2), rhythmic gymnastics (25), shooting (1), athletics (82), taekwondo (21), judo (4), archery (1), trampoline (7), water polo (19), handball (14), in a total of 333 coaches (56.9%) from individual sports while 69 (20,1%) in team sports. Administrators' participation in this study was voluntary while the cover letter of the questionnaire was assuring confidentiality and anonymity of the survey.

Measures

The ESC scale for coaches is administered to measure the impact degree of each criterion on the selection decision of a specific coach. It comprises 35 items allocated in six factors representing the themes regarding the evaluation and selection of coaches in the context of amateur sports. In particular, the "*results of coaching on athletes*" factor measures the impact of coaching practice on athlete's performance as an indicator of coaching effectiveness (e.g. "*improves the performance of individual athletes or teams*", "*improves ranking positions of athletes or teams*", "*identifies talents in sport*"). Coaching in this specific context refers to participation athletes as well as to performance athletes. Coaching for participating athletes focuses on fun, learning new sports skills, development of life skills, confidence, and interaction with other people (Lyle, 2002; Nelson, 2010; Perkins, Hahn, Keegan, & Collis, 2014). Coaching for performance athletes focuses on performance and aims at developing necessary skills and techniques to ensure success in performance (Lyle, 2002; Côté & Gilbert, 2009). The second factor "*personal achievements of the coach*" represents criteria measuring coaches' performance as they relate to the acknowledgment of their coaching work from agencies and stakeholders involved in the context of amateur sports. With this construct professionalism and

ongoing development of the coach can be observed through 5 items ("*publishes articles for coaching*", "*lectures in conferences or seminars for athletes/coaches*", and "*receives awards for his/her coaching work*"). The "*design and implementation of coaching*" factor represents measures of coaching knowledge and experience related to the development of the coaching process and the delivery of practices which are among the primary functions of a coach (Horton, 2015; Lyle, 2002). This factor comprises 6 items (e.g. "*teaching sports techniques effectively in training*", "*providing guidance actively and continuously to athletes and teams during training*", "*using sport equipment appropriately in training*", and "*individualized training*"). The "*competition management*" factor refers to criteria assessing coaching behaviours during competition. A coach must read and react appropriately to the field and manage emerging events during the competition (Abraham & Collins, 2011). In this respect, leadership abilities and effective decision-making are considered essential and are evaluated through the 3 criteria included in the unit (e.g., "*making appropriate decisions depending on the progress of the competition*", "*implementing tactics and strategies during competition*"). The "*psychological support of the athletes*" factor evaluates behaviours that support athletes psychologically during training or competition. Coach–athlete interactions are considered important for the outcomes of the coaching intervention as they occur constantly. In this context, coaches assume the role of supporting athletes' psychological well-being, by motivating them to improve their skills and performance. Coaches' primary functions include the responsibility to maintain positive relationships with athletes and to create a positive learning environment suitable for the implementation of the coaching program in which opportunities for life skills development are offered as well (Lyle, 2002). To that end, this specific factor through 7 items measures coaches' ability to create such a coaching environment, promote fair play, communicate effectively with athletes, motivate them, reward their efforts, prepare them appropriately for competition, and provide feedback during training or competition (e.g., "*preparing athletes or teams for competition*", "*communicating effectively with athletes or teams*", "*developing a pleasant training environment*", "*promoting fair play*"). Lastly, the "*commitment to the club*" factor deals with criteria related to the quality of relationships with club members and stakeholders as well as with the support provided for the promotion of the organization. Coaches' performance is directly related to and contributes to the welfare and the growth of a sports club. This contribution is achieved through adherence to rules, regulations, and organizational processes as well as through effective cooperation with the members of the club (McLean & Chelladurai, 1995). The last factor includes 5 items (e.g., "*cooperating effectively with club members*", "*complying with the club philosophy and operating principles*", and "*cooperating effectively with parents*").

The scale comprised 35 items to be answered on a five-point Likert-type scale (from 1 to 5: 1 = Not at all influenced, 2 = Slightly influenced, 3 = Moderately influenced, 4 = Very influenced, 5 = Extremely influenced). The instructions for completing the questionnaire were as follows: "*Indicate to what extent each of the following criteria influenced your decision to select or maintain an existing working relationship with this particular coach. There are no right or wrong answers. Please answer all questions*." The required time to complete all sections of the survey instrument was 15 minutes.

A separate section of the survey instrument was designed to collect demographic data. These data involved information related to the sports club (i.e. year of foundation, number of sports units, number of coaches), demographics of administrators responsible for selecting coaches (i.e. years of age, gender, years of experience in selecting coaches, position, years at the club) and demographic data of coaches (i.e. gender, years of age, graduation institute, level of professional license, sport, competition level of athletes, years of work experience, years of an athletic career, distinctions as an athlete, main professional occupation, working relationship with the club, type of occupation) was collected in this section.

Procedures

The development of the questionnaire followed three stages. The initial step was to conduct in person meetings with a focus group of 10 administrators of sports clubs to discuss issues regarding the selection process of their coaches. In parallel, the review of the literature relevant to employee selection, analysis of the coaching work, and performance appraisal criteria for coaches was carried out. As a result, six thematic units and a total of 35 items were generated. The assessment of content validity was the following step. Content validity of the scale was assessed by a panel of five experts. Experts were academicals holding a PhD degree in the area of sports management and sports psychology, all experienced in scientific research. The relevance of each item to the variable designated to measure was based on the Content Validity Index (CVI) with experts to indicate the relevance of each item to the field under investigation on a four-point scale (1 = not at all relevant, 2 = somewhat relevant, 3 = quite relevant and 4 = very relevant) (Davis, 1992). The CVI index (the percentage of questions rated 3 and 4 by the experts divided by the number of experts) was 0.82 with the expert-recommended value of the index at 0.80 (Davis, 1992; Polit & Beck, 2006). Experts' comments were used to modify and improve the wording of some items. Based on experts' ratings the 35 items were included in the scale. In the final step of the questionnaires' development, the instructions to be given, the demographic data section as well as the response format of the questionnaire were finalized. The questionnaire was distributed and collected over a period of eight months, during the competition season 2020-2021.

Sport club executives and administrators were contacted in person and provided with information regarding the aim of the survey. They were invited to participate and to arrange meetings with their colleagues responsible for the selection of coaches. Necessary information and clarification were provided when questionnaires were distributed to respective individuals. All participants in the survey were informed of the complete confidentiality of the data to be provided and its exclusive handling for the purposes of the study. They were asked to indicate the influence degree of each of the evaluation and selection criteria provided on their decision to select a specific coach. Distribution and collection of questionnaires conducted for eight months - October 2020 to May 2021 -during the competition season in 2020-21, a period right after the COVID-19 pandemic.

Analysis

The reliability of a questionnaire lies in its ability to provide accurate and stable measurements (i.e. consistent findings) at different times and conditions (Saunders, Lewis & Thornhill, 2012). Internal consistency is a measure of reliability and assesses whether different items measure the same concept (variable). To assess the internal consistency of each factor, the Cronbach's alpha statistic was used (Cronbach, 1951). Cronbach's α coefficient quantifies the level of agreement on a standardized 0 to 1 scale with values higher than 0.8 to indicate that the items on the scale measure the same construct and values less than 0.7 to indicate that an item on the scale may need to be deleted (Cronbach, 1951). According to researchers (Nunnally, 1978; Spector, 1992) index values greater than 0.7 are considered satisfactory. The higher the value of Cronbach's α coefficient, the higher the internal consistency reliability (Litwin, 1995).

Construct validity refers to how well a measurement tool measures the idea or the concept it claims to measure and reflects the theory it is based on. Because the validity of a conceptual construction of a tool is not directly observable, factor analysis is performed to identify the groups of items that are conceptually and statistically related to each other and to highlight the variables to be measured. To check the construct validity of the ESC scale, an Exploratory Factor Analysis was performed. For the extraction of the factors, the method of Principal Component Analysis (PCA) was applied, a method that, according to Hair, Anderson, Tatham, and Black (1995), is considered one of the most acceptable methods. The K.M.O. (Kaiser - Meyer - Olkin)

measure of sampling adequacy was used to check the overall sampling suitability to factor analysis. The test measures sampling adequacy for each variable in the model and for the complete model. KMO values between 0.8 and 1 indicate the sampling is adequate. The Bartlett's Test of Sphericity was used to examine the suitability of the data for factorial analysis. The significance value of Bartlett's Test of Sphericity must be less than 0.05 for the factor analysis to be acceptable.

Exploratory Factor Analysis (EFA) techniques were used to explore if an item set is associated with a construct (or specifically designed to measure a certain psychological variable) and subsequently to refine it. Factor analysis requires to set the number of factors to be extracted. However, to determine the number of factors the criterion of the percentage of Variance (% of Variance) was used, which interprets each factor in combination with the eigenvalues. Often a solution that accounts for 60% of the total variance, and in some cases even less, is considered satisfactory (Hair, et al., 1995). Factor loadings were checked to check the percentage contribution of the variables to the formation of the factors. Factor loadings represent the correlation between the initial variables and the factor to which they belong. These values are examined in conjunction with the sample size and the significance level. Experts note that in a sample larger than 200 people, with a significance level of 5 %, loadings with an absolute value of 0.40 and above are considered significant (Hair et al., 1995). The method of Principal Component Analysis (PCA) with oblique rotation of the axes was applied as one of the most accepted methods to extract factors (Hair, et al., 1995).

Confirmatory Factor Analyses (CFA) are often used in psychological research when developing measurement models for psychological constructs. Confirmatory Factor Analysis (CFA) was used in this study to confirm the structural validity of the Evaluation and Selection Criteria scale. CFA was performed using EQS Multivariate Software Version 5.7b the results were extracted using the maximum likelihood estimation method.

However, before CFA was conducted normality of data was assessed and the distribution of variables was tested by: (a) univariate skewness, (b) univariate kurtosis, (c) Mardia univariate kurtosis (Mardia, 1970), which specifies the multivariate regularity limits. Univariate regularity was tested to check if the items should be conserved or eliminated from the factor analysis (West, Finch & Curran, 1995). Multivariate regularity was used to identify and select the appropriate factor data analysis method (Bollen, 1989; West, Finch, & Curran, 1995). According to many researchers, several goodness-of-fit indices have been developed to quantify agreement or deviation from perfect model fit and can be employed to evaluate model fit (Hu & Bentler, 1998).

Therefore, the following indexes were used to assess models' fit through the Confirmatory Factor Analysis: (1) χ^2 (chi-square), df (freedom degrees), χ^2/df ratio, Satorra – Bentler chi- square index χ^2 (2) Non- normed fit index, (3) Comparative Fit Index (CFI), (4) Robust Comparative Fit Index (RCFI), (5) Incremental Fit Index (IFI), (6) Standardized Root Mean Squared Residual (SRMR) and (7) Root Mean Squared Error of Approximation (RMSEA) and the 90% Confidence Interval of RMSEA (Bentler, 1990; Bentler & Chou, 1987; Byrne, 1994; Bollen, 1989; Hoyle & Panter, 1995; Hu & Bentler, 1999; Tabachnick & Fidell, 2006). The statistic index χ^2 is influenced by the sample size, by the freedom degrees as well as by the violation of the normality assumptions (Bentler, 1995; Hu & Bentler, 1995; Kline 1998). However, many researchers proposed that when evaluating a model, the χ^2/df ratio is considered a more reliable index compared to χ^2 (Bentler & Bonett, 1980). When χ^2/df rates are between 2 and 5, then an acceptable model structure can be supported. When χ^2/df rates are lower than 2, the model has an impressive data application (Byrne, 1989; Kelloway, 1998). NNFI, CFI, RCFI, and IFI have a range of possible values from 0 to 1; rates greater than .900 imply an acceptable factor structure of the tested model (Bentler, 1990). Hu and Bentler (1999) proposed

a much stricter criterion for the acceptance of NNFI and CFI indexes, placing the acceptance limit rates to .950. On the other side, when the index rates of SRMR and RMSEA of the tested model are lower than .050, then the factor structure could be accepted (Steinger, 1990; Tabachnick & Fidell, 1996). According to Hu and Bentler (1999) the acceptance limit of SRMR index is near .080 and for the RMSEA index is .060, while other researchers identify the best fit limit at the rate of .050 (Bollen, 1989; Tabachnick & Fidell, 1996). Browne and Cudeck (1993) suggest that a 90% CI (confidence interval) of RMSEA rate between 0 and .05 indicates a close fit, less than .08 represents a reasonable fit, while greater than .08 suggests a poor fitting model. Lastly, many researchers support that a lower rate than .050, indicates the existence of a proper fit, while the rates between .050 and .100 note the existence of an acceptable factor structure of the tested model (McAuley, Duncan, & Tammen, 1989; Rupp & Segal, 1989).

According to the results of the EFA as well as the theoretical background of the current study item loadings to factors should be higher than .40 to be acceptable, which is an acceptable item loading rate for social sciences (Bentler, 1995). Furthermore, it is worth mentioning that items were «allowed» to load only from their factor. Loadings of other factors were rated at 0.00 while measurement error correlation was not permitted (Bentler, 1995).

The IBM Statistical Package for the Social Sciences (SPSS), version 22 was used for the statistical analyses of data in this study through confirmatory factor analysis (Bentler, 1995). Before factor analysis, a review of the dataset confirmed that there were no missing data in this study's dataset.

RESULTS

Bartlett's test of sphericity index (17521.324, df 595, $p < .00001$) indicated the rejection of the null hypothesis that variables are unrelated. KMO value was at an absolute satisfactory level (KMO = .946) indicating that data is suitable for factor analysis. Exploratory Factor Analysis with the Principal Component Analysis (PCA) technique was based on the above-mentioned factor selection criteria (eigenvalue plot, factor eigenvalue greater than 1, percentage of explained variance per factor, total explained variance, conceptual interpretation of factors) (Kline, 1994; Nunnally & Bernstein, 1994; Tabachnick & Fidell, 2006; Tinsley & Tinsley, 1987; Tucker, Koopman, & Linn, 1969) and supported the existence of six factors interpreting the 72.044% (% Cumulative) of total variance. Items' loadings and communalities ranged from .391 to .999 and .539 to .839 respectively. However, the results of the analysis revealed problems in some scale items. Based on statistical criteria, such as loadings, cross-loadings, communalities as well as conceptual criteria, six (6) items were excluded from further analysis in this study (items 1, 2, 5, 17, 22, 25). As a result, reliability analysis was conducted again and factor structure was retested in the 29-items scale with these variables omitted. Bartlett's test of sphericity index (13338.366, df 406, $p < .00001$) indicated the rejection of the null hypothesis that variables are unrelated while the value of KMO = .934 is at an absolutely satisfactory level. The Principal Component Analysis (PCA) technique supported six factors interpreting the 73.396% (% Cumulative) of the total variance. Items loadings and communalities ranged from .634 to .971 and .560 to .880 respectively. The results of the reliability test of the scale are presented in Table 1.

The first factor "*results of coaching on athletes*" corresponds to 3 items: "*improves the performance of individual athletes or teams*", "*improves the ranking of athletes or teams*" and "*identifies talents*". The second factor "*personal achievements of the coach*" refers to 5 items: "*receives awards for coaching by social agencies*", "*receives recognition for coaching by other coaches*", "*publishes articles for coaching*", "*gives lectures in conferences or seminars for athletes/coaches*", "*receives recognition for coaching by sports agents*". The third factor "*design and implementation of coaching*" corresponds to 6 items: "*uses sports*

equipment appropriately in training", "*individualizes training*", "*teaches sports techniques effectively*", "*evaluates successfully athletes' potential*", "*provides guidance actively and continuously to athletes and teams during training*" and "*develops and implements the training program appropriately*". The fourth factor "*competition management*" corresponds to 3 items: "*makes appropriate decisions depending on the progress of the competition*", "*highlights and corrects mistakes during competition*" and "*implements tactics and strategies during competition*".

Table 1. Loadings and communalities of the items of the coaches' evaluation and selection criteria scale.

	Item	Loadings						Communalities
		1	2	3	4	5	6	
24	Rewards psychologically athletes or teams	0.933						0.78
23	Communicates effectively with athletes or teams	0.93						0.769
20	Develops a pleasant training environment	0.828						0.683
22	Promotes fair play	0.789						0.692
18	Supports psychologically athletes or teams	0.781						0.731
21	Motivates athletes or teams to put more effort	0.764						0.713
19	Prepares athletes or teams for competition	0.635						0.738
2	Improves performance of individual athletes or teams through training		0.938					0.841
1	Improves ranking of athletes or teams		0.931			0.338		0.809
3	Identifies talents		0.867					0.726
6	Publishes articles for coaching			0.971				0.819
7	Give lectures in conferences or seminars for athletes/coaches			0.96				0.806
4	Receives awards for coaching by social agencies			0.768				0.698
5	Receives recognition for coaching by other coaches			0.673				0.693
8	Receives recognition for coaching by sport agents			0.566				0.56
29	Understands the financial potential of the club				0.827			0.699
27	Complies with the club philosophy and operating principles				0.819			0.719
28	Contributes to the promotion of the club by organizing events				0.786		0.368	0.747
26	Cooperates effectively with parents				0.76			0.695
25	Collaborates effectively with club members				0.725			0.715
16	Makes appropriate decisions depending on the progress of the competition					0.928		0.88
15	Highlights and corrects mistakes during competition					0.922		0.844
17	Implements tactics and strategies during competition					0.916		0.856
14	Uses sport equipment appropriately in training						0.634	0.607
11	Individualizes training						0.622	0.74
10	Teaches sport techniques effectively						0.601	0.728
12	Evaluates successfully athletes' potential		0.343				0.575	0.725
13	Provides guidance actively and continuously to athletes and teams during training						0.481	0.665
9	Develops and implements the training program appropriately						0.424	0.607
Eigenvalues		12.376	2.991	2.574	1.388	1.072	0.884	
% Cumulative Interpretation		42.675	10.314	8.876	4.787	3.698	3.047	

Note. Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.

The fifth factor "*psychological support of the athletes*" corresponds to 7 items: "*rewards psychologically athletes or teams*", "*communicates effectively with athletes or teams*", "*develop a pleasant training environment*", "*promotes fair play*", "*supports psychologically athletes or teams*", "*motivates athletes or teams to put more effort*" and "*prepares athletes or teams for competition*". The sixth and last factor "*commitment to the club*" corresponds to 4 items: "*understands the financial potential of the club*", "*complies with club's philosophy and operating principles*", "*contributes to the club's promotion by organizing events*", "*cooperates effectively with parents*" and "*cooperates effectively with club members*".

The reliability test followed the extraction of the six factors with the 29 items in the scale using PCA technique. For that purpose, the internal consistency of the factors of the Evaluation and Selection Criteria for coaches' scale was checked. The results of the application of the scale's reliability control methods are presented in Table 2. Cronbach's α values, as a basic indicator of the internal consistency of the scale, reached a completely satisfactory level, with values higher than .70 indicating an acceptable degree of internal consistency (Hair et al., 1995; Nunnally & Bernstein, 1994). In addition, item-scale correlations as well as inter-item correlations were fully acceptable.

Table 2. Reliability indexes of the evaluation and selection criteria for coaches scale.

	Inter-item Correlations Mean (Min – Max)	**Inter-item Covariances Mean (Min – Max)**	**Item-scale Correlations Mean (Min – Max)**	**Cronbach's *α***
Results on athletes	.743 (.666 - .852)	.612 (.560 - .688)	.796 (.715 - .819)	.90
Personal achievements	.604 (.463 - .835)	.909 (.693 - 1.238)	721 (.625 - .764)	.88
Design and implementation of coaching	.602 (.451 - .717)	.390 (.313- .471)	.729 (.579 - .790)	.90
Competition management	.822 (.770 - .877)	.745 (.696 - .821)	.862 (.819 - .902)	.93
Psychological support of the athletes	.650 (.540 - .799)	.329 (.267- .460)	.773 (.736 - .806)	.93
Commitment to the club	.576 (.489 - .667)	.553 (.448 - .835)	.694 (.667 - .711)	.87

In the next step, Confirmatory Factor Analysis was carried out to specify the number of factors in the model proposed by the Exploratory Factor Analysis and confirm the measurement theory. Univariate skewness rated from -1.83 to 0.56 and univariate kurtosis rated from -0.91 to 5.64 indicating that the scale items have been normally distributed as both measures haven't exceeded the limits of 2 and 7 respectively (West Finch, & Curran, 1995). Mardia's coefficient of multivariate kurtosis supports the existence of the normalized estimate [normalized estimate = 112.0664 < 29 (29+2)]. For examining the structure of the scale, the maximum likelihood method (ML) was employed. The CFA revealed that the six-factor 29-item model fits data well. The model's goodness-of-fit indexes were as follows: χ^2 = 13582.573, p < .001, Satorra-Bentler χ^2 = 822.090, p < .001, df 359, χ^2 /df ratio = 2.290, NNFI = .926, CFI = .934, RCFI = .919, IFI = .934, SRMR = .059, RMSEA = .064 (90% CI of RMSEA = .060 - .068). In particular, the examination of the six-factor model's fit showed that χ^2 index was statistically significant, which means that there were statistically significant differences between the proposed model and the sample data, although it is appropriate to note that χ^2 index and the χ^2 /df ratio are affected by the sample size. Factor item loadings were satisfactory and ranged from .64 to .96, while the item errors received values from .30 to .77 (Figure 1).

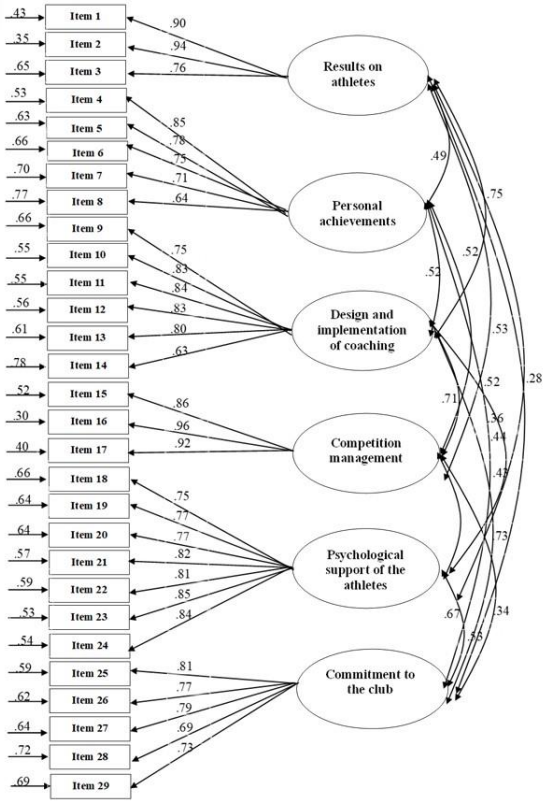

Figure 1. Item's loadings and errors of coaches' evaluation and selection criteria scale.

In order to examine the suitability of the six-factor model of the ESC scale for coaches in the confirmatory factor analysis context, two alternative models were examined. In particular, the first model included the selection of six correlated factors (FC6), while the second alternative model included the selection of one factor (OF1) to investigate whether the examined scale is a single-factor model. As a result, fit indices of the models supported that the six correlated factor solution (FC6) has the best fit while the one-factor solution (OF1) did not achieve as good indices (Table 3).

Table 3. Coaches' evaluation and selection criteria questionnaire confirmatory factor analysis: Fit indexes of two alternative factor structure models.

Fit indexes	**FC_6 Six Correlated Factors**	**OF_1 One Factor**
χ^2	1225.179	2313.45
df	359	383
p	.001	.001
NNFI	.926	.789
CFI	.934	.802
RCFI	.919	.801
IFI	.934	.787
SRMR	.059	.178
RMSEA	.064	.180
90% CI of RMSEA	.060 - .068	.135 - .230

Abbreviations: χ^2 = chi square index, df = freedom degrees, NNFI =non – normed fit index, CFI = comparative fit index, RCFI = robust comparative fit index, SRMR = standardized root mean square residual, RMSEA = root mean square error of approximation, 90% CI of RMSEA= 90% RMSA Confidence Interval.

DISCUSSION

This study attempted to develop and validate a questionnaire measure designed to assess the impact of the Evaluation and Selection Criteria in the selection decision of coaches. The validation of the scale was conducted among a sample of 585 coaches working for amateur sports clubs in the region of Attica in Greece. An initial list of 35 statements was refined while factor analyses revealed a 29-item scale. Based on the data, a six-factor structure was identified using oblique rotation. The confirmatory factor analysis performed on the 29-item scale indicated that the six-factor structure fits the data well. The first factor "*results of coaching on athletes*" assesses the results of coaching practice on athletes and focuses on the improvement of athletes' performance measuring the impact of coaching intervention. In line with the literature that supports that effective coaches are considered those who through their behaviours produce positive athlete outcomes, the items of this factor reflect the administrators' assessment of the impact of coaching practice on athletes (Boardley, Kavussanu, & Ring, 2008; Horn, 2008; Vella & Gilbert, 2014). The second factor "*personal achievements of the coach*" incorporates five items related to the recognition of the coaching work of the individual coach and his/her dedication and orientation to the development and evolution of coaching. Such accomplishments reflect the assessment of the coach's expertise and performance by sports community agents and they are taken into consideration by administrators when evaluating a coach (MacLean & Chelladurai, 1995). The "*design and implementation of coaching*" factor relates to the primary task of the coach to design, organize and deliver the practice sessions and assesses behaviours that reflect his/her expertise and effectiveness in coaching (Lara-Bercial et al., 2017). The technical skills of a coach have been found of primary importance in the selection criteria of Iranian national coaches (Hamidi & Memari, 2014). Such criteria that reflect the ability of the coach to organize and implement effectively the coaching practice are considered important in every evaluation of the coaching performance model (Antunes, Soares, Rodrigues & Velosa, 2020). In consistency with the literature that supports that a coach's main responsibility is the appropriate management of sports competition related aspects and his/her performance in this specific field is receiving attention and value, the "*competition management*" factor's items refer to the abilities of the coach to make appropriate decisions, to highlight and correct mistakes during competition, as well as to implement tactics and strategies during the competition (Lara-Bercial et al., 2017). The fifth factor "*psychological support of the athletes*" captures supportive coaching behaviours such as providing positive feedback, offering a pleasant training environment, promoting fair play, motivating, and preparing athletes or teams for competition. These behaviours relate to leadership and communication abilities which are considered required for a successful coaching performance (West, 2016). Lastly, the "*commitment to the club*" factor refers to the contribution of the coach to the viability of the organization by adhering to clubs' rules and regulations and developing and maintaining effective relations with club members and parents (MacLean & Chelladurai, 1995).

The ESC scale incorporates many key elements of the evaluation and selection of coaches from amateur sports clubs. The examination of the psychometric properties of the scale provided preliminary evidence for the validity and reliability scores of the measure. Psychometric properties supported that the overall 29-item tool had a Cronbach's alpha coefficient of .90 indicating that the measure is reliable. The six factors "*Results of coaching on athletes*", "*Personal achievements of the coach*", "*Design and implementation of coaching*", "*Competition management*", "*Psychological support of the athletes*" and "*Commitment to the club*" received Cronbach's alpha coefficients of .90, .88, .90, .93, .93 and .87 respectively indicating an acceptable degree of internal consistency.

This study highlights the importance of addressing the appropriate selection criteria for coaches to work in an amateur sports club in the domain of youth sports. However, this work serves to alert sports managers,

administrators, and executives of a sports club to the need to develop a selection criteria model for every coaching position in their organization to help sports clubs set up their own systems of selecting coaches.

The present study offers a comprehensive set of evaluation and selection criteria for coaches and explains their development process. The findings of the study indicate that the 29-item scale is an adequate measure in terms of psychometric characteristics to investigate the evaluation and selection criteria of coaches in a given context. However, the participants in this study were coaches selected from amateur sports clubs in Attica, Greece. Thus, it is not known if the psychometric properties of this scale would be similar for coaches working in other regions of the country or around the world.

The primary goal of this research was to develop a reliable and valid evaluation and selection criteria scale for coaches. This new scale constitutes a measure with adequate reliability and construct validity to examine the criteria that play the most important role in the selection of a specific coach in a specific context. However, future research could possibly expand this scale by incorporating criteria that relate to another population or context.

CONCLUSIONS

The study aimed to develop and validate an instrument for measuring the impact of each selection criterion on administrators' decision to select a coach to work in a specific coaching position in order to identify the selection criteria of coaches working in amateur sports clubs. The application of factor analysis revealed a six-factor structure model for the Evaluation and Selection Criteria scale and provided evidence for the scale to be a reliable and valid tool to be used when selection criteria for coaches are investigated. Six thematic units regarding coaching competence and outcomes of coaching work were covered following the analysis of the coaching job in a specific position. This work provides literature with a comprehensive, reliable, and valid set of criteria for selection of coaches in the amateur sports context. The results of the study demonstrated strong psychometric properties of the ESC scale for coaches in terms of validity and reliability.

In addition, the results of this study can be useful for coaches as well as for the administrators of an amateur sports club providing insights on how coaching competencies and achievements are evaluated upon selection and how related criteria are developed. With appropriate modification, the ESC scale for coaches constitutes a valid, reliable, and easy-to-use tool for sports club administrators to evaluate and select their coaches.

AUTHOR CONTRIBUTIONS

This manuscript is a collaborative work of six authors who reviewed and approved its final version. The contribution of each author includes: Christina Anthi: study conception and design, review of the literature, data collection and analysis, draft manuscript. George Kipreos, study supervision and approval of final manuscript. Panagiota Antonopoulou: reviewed and approved theory and measure. Krinanthi Gdonteli: review of discussions and conclusions. Vasilios Kakkos: conceptualization and design of the study. Nektarios Stavrou: data analysis and interpretation of results.

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No potential conflict of interest was reported by the authors.

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