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The role of transformational leadership in the associations between coach-athlete relationship and team resilience: A study on elite football players

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Abstract

This study explores the relationship between the quality of coach-athlete relationships, transformational leadership style, and team resilience in elite football players. The coach-athlete relationship is an essential factor affecting many performance-related properties of athletes, such as mental health, psychological needs, motivation, and resilience. The study examines how the quality of coach-athlete relationships explains the team resilience feature through transformational leadership. The research group includes 210 elite players from the Super League, First League, Second League, and Third Leagues of the Turkish Football Federation (TFF) in the 2020–2021 football season. The study used descriptive and relational models to explore the current state of the dependent and independent variables and examine their relationships. The findings revealed insights into the mediating role of the coach's transformational leadership qualities, highlighting how the quality of coach-athlete relationships impacts team resilience.

Keywords Interpersonal relationship, Resilience, Leadership dynamics, Professional football

Introduction

Team resilience can be described as a dynamic and psychosocial phenomenon that serves as a safeguard, shielding a collective of individuals from potential adverse repercussions stemming from the stressors they jointly encounter [1]. This concept revolves around a team's amalgamated mental and emotional fortitude, enabling them to surmount obstacles and pursue objectives [2]. Notably, resilience is pivotal in managing and recovering from stress within competitive sporting domains and is

often heralded as a critical determinant of achievement [3].

In times of turbulence, resilient teams exhibit enhanced productivity, adaptability, and innovation [4]. Empirical investigations have disclosed five distinct categories encompassing many pragmatic strategies, initiatives, and catalysts for cultivating team resilience. These categories contain the following elements: instilling inspiration, motivation, and challenges among team members to attain performance excellence; instituting a team-based regulatory framework founded upon ownership and accountability; nurturing a collective identity and cohesiveness grounded in a culture of selflessness; exposing the team to strenuous training and unforeseen arduous situations; and fostering a sense of enjoyment and cultivating a positive outlook amidst stressors [5]. Practical

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recommendations are proffered for advancing individual and team resilience by leveraging insights from resilience research in elite sports. These recommendations encompass the augmentation of personal attributes, the perpetuation of a mindset that embraces challenges, the creation of a supportive milieu, and the utilisation of transformational and shared leadership, social identity, team learning, and the cultivation of positive emotions [6]. Elite athletes frequently confront a multitude of stressors during their sporting endeavours, given the competitive sporting realm's inherent nature as a performance context necessitating the adept management of stress and adversity to attain their objectives. These demands are typically intertwined with competitive performance, the organisational structure of the sports arena in which athletes are situated, and the vicissitudes of their lives outside the sphere of sports [7]. Elite sports teams often operate within exceedingly high-pressure environments, where specific teams demonstrate resilience in the face of these demands. In contrast, others succumb to detrimental effects under such pressure [8].

Coaches can assist their athletes in effectively managing the challenges and setbacks associated with elite sports by cultivating an environment characterised by supportive communication and nurturing practices. The study of coach behaviours has encompassed various approaches, from examining leadership theories to exploring relationship conceptual frameworks. These diverse perspectives have been instrumental in shedding light on the multifaceted nature of coaching and its impact on athletes [9, 10]. Coaches are encouraged to conduct thorough profiling and assessment of the resilient attributes inherent within their team members. This process should also involve identifying strategies aimed at mobilising specific psychosocial resources, all with the overarching goal of augmenting the overall resilience of the team [1, 8]. Studies also showed that transformational leadership behaviours were positively associated with coach-athlete relationship quality [11].

Building on this understanding of team resilience and its crucial role in elite sports, it is imperative to delve into the intricate dynamics of the coach-athlete relationship and its impact on team resilience. White and Bennie [12] explored the perspectives of both gymnasts and coaches regarding cultivating resilience through participation in gymnastics. They revealed that the gymnastics environment introduced stressors and presented numerous challenges during training and competitive scenarios. However, some aspects within the sports environment, including interpersonal relationships and positive coaching behaviours, played a significant role in bolstering gymnasts' resilience by providing support during challenging circumstances and motivating them to persevere in the face of setbacks. One key aspect to explore within

this context is the influence of coach behaviours, particularly the transformational leadership qualities of coaches. A recent study by Gosai et al. [13] demonstrated that the perceived transformational leadership behaviours exhibited by coaches substantially influenced the overall quality of the coach-athlete relationship. Rodríguez-Sánchez and Perea [14] found that transformational leadership is pivotal in fostering a proactive and resilient organisational culture.

Transformational leadership, characterised by its ability to inspire and motivate individuals toward achieving their full potential [15], has been identified as a significant factor in enhancing team resilience [6, 16]. The way coaches interact with their athletes, the level of trust and rapport they establish, and their capacity to instil a sense of purpose and passion in their team members can significantly influence the quality of the coach-athlete relationship [17–19]. This relationship quality, in turn, directly affects the team's overall resilience [20].

Coaches who exhibit transformational leadership characteristics, such as communicating a compelling vision, providing support and mentorship, and promoting personal growth and self-efficacy among their athletes, are likelier to foster a positive and resilient team culture. These coaches create an environment where athletes feel valued, motivated, and capable of facing adversity head-on. In addition to transformational leadership, other coach behaviours, including effective communication, empathetic understanding, and cultivating a supportive atmosphere, play pivotal roles in shaping the coach-athlete relationship. Coaches who excel in these areas are better equipped to navigate the challenges inherent in elite sports and help their athletes develop the psychological fortitude needed to withstand stressors and setbacks. Expanding upon prior research, the present study endeavours to achieve two primary objectives: firstly, to scrutinise the interconnections between the quality of coach-athlete relationships and team resilience within the context of football teams, and secondly, to delve into whether the concept of transformational leadership elucidates the relationship between the quality of coach-athlete relationships and team resilience in football. This research identifies whether transformational leadership mediates the association between coach-athlete relationship quality and team resilience. Should transformational leadership emerge as a mediator, it would imply that the transformative qualities of leadership amplify the positive impact of coach-athlete relationship quality on team resilience. This, in turn, can offer valuable insights into the roles played by transformational leadership and coach-athlete relationship quality in cultivating a resilient team culture.

The practical significance of this study lies in its potential to contribute to our understanding of the processes

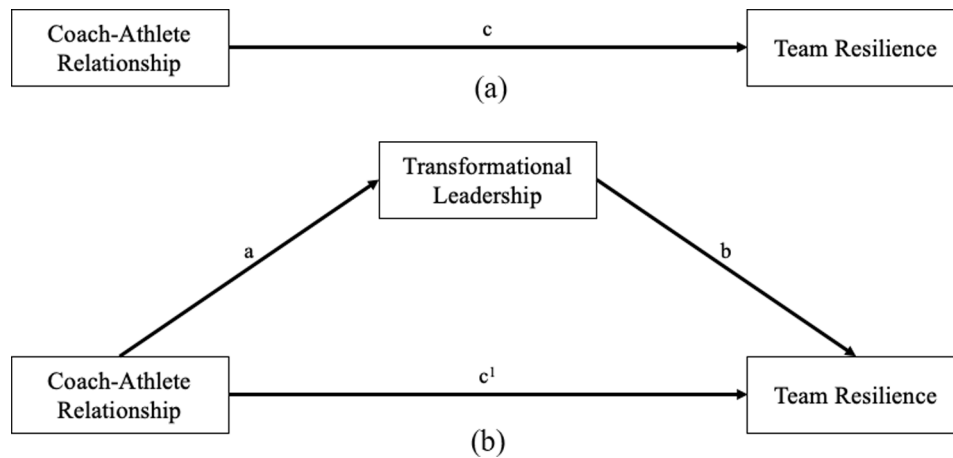


Fig. 1 (a) Total effects of coach-athlete relationship quality on team resilience in sport. (b) The mediation model proposes that the coach-athlete relationship indirectly predicts team resilience through transformational leadership

Table 1 The relationship between coach-athlete relationship, team resilience, and transformational leadership levels of the football players

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---|
| 1. Coach-Athlete relationship quality (CARQ) | 1 | | | | | | | | |
| 2. Resilient characteristics (DRC) | 0.606** | 1 | | | | | | | |
| 3. Acceptance of group goals (AGG) | 0.688** | 0.473** | 1 | | | | | | |
| 4. Appropriate role model (ARM) | 0.643** | 0.462** | 0.833** | 1 | | | | | |
| 5. Contingency reward (CR) | 0.620** | 0.418** | 0.818** | 0.816** | 1 | | | | |
| 6. High performance expectation (HPE) | 0.565** | 0.491** | 0.748** | 0.679** | 0.712** | 1 | | | |
| 7. Individual consideration (IC) | 0.643** | 0.371** | 0.825** | 0.855** | 0.827** | 0.746** | 1 | | |
| 8. Inspirational motivation (IM) | 0.620** | 0.438** | 0.841** | 0.814** | 0.813** | 0.784** | 0.852** | 1 | |
| 9. Intellectual stimulation (IS) | 0.542** | 0.362** | 0.788** | 0.840** | 0.739** | 0.668** | 0.858** | 0.816** | 1 |

** $p < 0.01$; $n = 210$

through which team resilience is nurtured within sports teams. While existing evidence suggests that coaches shape the team environment, the findings of this study promise to shed light on whether athletes, through their interactions with coaches, can catalyse the development of resilient attributes within their teams.

Methods

Proposed theoretical model

This study’s comprehensive investigation uses descriptive and relational analytical frameworks. The primary objective of employing these models was to clarify the contemporary status of dependent and independent variables while concurrently scrutinising their intricate interconnections. Furthermore, an in-depth inquiry was conducted using a descriptive and relational model to unveil the latent ramifications of the coach-athlete relationship on team resilience, accomplished by the intermediary influence of transformational leadership. Central to our research framework are the formulated hypotheses. It was hypothesised that the calibre of the coach-athlete relationship quality functions as a prognostic indicator for the resilience of the sports team (as illustrated in

the total effect model, represented in Fig. 1a). In tandem with this, an additional conjecture was advanced, stipulating that the coach-athlete relationship quality, through its multifaceted connection with transformational leadership, indirectly influences the overall resilience of the sporting team (as articulated in the mediation model, illustrated in Fig. 1b). This hypothesis seeks to discern the direct and indirect pathways through which the coach-athlete relationship impacts team resilience within the sporting context. We have tested each dimension of TLI as a mediator variable between CARQ and DRC.

Participants

The study encompassed the participation of a cohort of elite football players (age \pm SD = 24.05 \pm 4.73, min:16 and max: 35, $N = 210$) who were actively engaged in competitive play within the upper echelons of the Turkish Football Leagues during the 2020–2021 football season under the jurisdiction of the Turkish Football Federation (TFF). These individuals were selected based on their representation at the pinnacle of football competition in the country. The participating athletes’ accumulated experience within the professional football domain indicated their

extensive involvement, with an average playing experience of 11.98 years ($SD=5.37$, min: 1 and max: 26). The football leagues from which the sample was drawn were notably elevated calibre, encompassing participation in the Turkish football structure's Super League (%23.8, $n=50$), First League (%14.3, $n=30$), Second League (%47.1, $n=99$), and Third League (%14.8, $n=31$). This league representation underscores the high standard of play exhibited by the subjects. Integral to the athletes' commitment, they engaged in rigorous training sessions on a routine basis, explicitly dedicating 5–6 days per week to structured training and participating in official matches once weekly as a component of their standard team involvement. It is pertinent to highlight that participants in their first year collaborating with their current coach were excluded from the analysis. This decision was rooted in capturing football players' perceptions about their coaches, necessitating a specific duration of engagement to yield comprehensive insights. The tenure of the participants' current coach affiliation averaged 1.73 ± 1.42 years, signifying a noteworthy period of interaction and instruction under the present coaching arrangement.

Data Collection process

Coach-athlete relationship quality: The research instrument employed in this study to assess the coach-athlete relationship among the participants was the "Athlete Form" of a scale developed by Jowett and Ntoumanis [21]. Altıntaş et al. [22] subsequently adapted this scale to the Turkish context. The primary purpose of utilising this instrument was to gather comprehensive data on the dynamics within the coach-athlete relationship. The instrument used in this study is a Likert scale, comprising 11 items that facilitate self-evaluation by athletes and coaches. Respondents must rate their agreement with each item on a scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). This scale includes two distinct versions, one tailored for athletes and the other designed for coaches, each consisting of identical items. These items are grouped into three sub-dimensions: Closeness, Commitment, and Complementarity. Calculating sub-dimension scores involves summing the individual responses provided by participants to the items corresponding to each sub-dimension.

Consequently, separate sub-dimension scores are generated for Closeness, Commitment, and Complementarity, allowing for a nuanced analysis of the coach-athlete relationship. Regarding the reliability of the athlete form of this inventory, the internal consistency of the Closeness and Commitment sub-dimensions is reported to be relatively high, with Cronbach's alpha values of 0.90. Additionally, the Complementarity sub-dimension exhibits a satisfactory level of internal consistency, as indicated by a Cronbach's alpha coefficient of 0.82. These reliability

coefficients testify to the scale's robustness in measuring the specific aspects of the coach-athlete relationship [22].

Team Resilience: In the context of this research, data concerning team resilience were gathered utilising the Team Resilience (CREST) inventory [23]. The primary objective of employing this inventory was to assess athletes' perceptions regarding the resilience exhibited by their respective teams. The CREST inventory, consisting of 20 items, operates on a 7-point Likert scale, enabling respondents to express their agreement or disagreement with each item. This scale is instrumental in evaluating two distinct subscales: "Displaying Resilient Characteristics" and "Vulnerabilities Displayed Under Pressure." These subscales are pivotal in discerning the multifaceted nature of team resilience within the sports context. Gorgulu et al. [24] adapted the CREST inventory to the Turkish cultural and linguistic context. This adaptation ensured the applicability and relevance of the instrument to the local context, allowing for the precise measurement of team resilience as perceived by Turkish athletes.

Furthermore, Cronbach's alpha coefficient was computed to assess the internal consistency and reliability of the Turkish adaptation of the CREST inventory. The Cronbach's alpha coefficient, which amounted to 0.74, indicates satisfactory internal consistency for the inventory. This value underscores the instrument's reliability in measuring team resilience and provides confidence in the data collected in the present study. Notably, within the theoretical model utilised in this study, the "Displaying Resilient Characteristics" subscale from the CREST was explicitly employed as a critical factor of interest, shedding light on its role within the broader framework of athlete-coach dynamics.

Transformational Leadership: In this study, an assessment of athletes' perceptions regarding their coaches' transformational leadership qualities was conducted by employing the Differentiated Transformational Leadership Inventory, initially developed by Callow et al. [25] and validated in the sport context by Vella et al. [26] This instrument is instrumental in evaluating the multifaceted aspects of transformational leadership as perceived by athletes. The Transformational Leadership Inventory comprises 27 items, further organised into seven distinct subscales, providing a comprehensive overview of the various dimensions of transformational leadership. These subscales encompass the following domains: "Acceptance of Group Goals and Support for Teamwork," "Appropriate Role Modelling," "Contingent Reward," "High-Performance Expectations," "Individual Consideration," "Inspirational Motivation," and "Intellectual Stimulation." Each of these subscales is a unique dimension through which transformational leadership qualities are evaluated. Participants were asked to respond to these items, providing insights into their perceptions regarding the

coaching leadership style. Gorgulu et al. [27] conducted a rigorous adaptation process for the Transformational Leadership Inventory to ensure the instrument's cultural relevance and applicability within the Turkish context. This adaptation process involved linguistic and contextual adjustments, facilitating its utility in the local sporting landscape. The reliability of the tool's Turkish adaptation was assessed by calculating Cronbach's alpha coefficient. The obtained value for the entire scale, which amounted to an impressive 0.97, signifies high internal consistency and reliability. This robust Cronbach's alpha coefficient underscores the instrument's precision and trustworthiness in evaluating athletes' perceptions of their coaches' transformational leadership qualities.

Procedure

This study was conducted by the Declaration of Helsinki. The research has been approved by the Clinical Research Ethics Committee of Canakkale Onsekiz Mart University on 02.11.2020 (Protocol No: 2020/127). The participants for this study were enlisted under the guidance of the primary author, who employed a multifaceted approach involving both online and physical mediums to gather data. Specifically, the recruitment process encompassed distributing digital surveys and tangible questionnaires. Communication was established with the coaches responsible for the football teams involved to ensure a comprehensive understanding of the study's objectives. Through this correspondence, the coaches were provided with an elucidation of the study's underlying objectives. After explaining the study's objectives, the football players were allowed to participate voluntarily. It was duly emphasised that their participation was optional and that they retained the autonomy to cease their involvement during the data collection process should they experience discomfort or reservations. Each questionnaire administered to the football players featured a set of standardised instructions corresponding to the specific measurements being undertaken. These instructions were thoughtfully designed to underscore the importance of upholding the confidentiality of the responses provided by the participants.

Furthermore, the instructions explicitly conveyed that no absolute criteria existed for "right" or "wrong" answers within the study context. Instead, the emphasis was placed on fostering a climate of openness and honesty, wherein participants were encouraged to respond truthfully and authentically, thereby contributing to the integrity of the research outcomes. We recruited football players working with the same coach for at least a year.

Statistical analysis

The data underwent a comprehensive screening process encompassing identifying and treating outliers and

assessing normality. The subsequent analytical procedures contained a series of techniques, including descriptive statistics, internal consistency coefficients, and bivariate correlations, all executed to elucidate the interrelationships between the variables at hand. To facilitate these analyses, composite mean scores were computed to represent the coach-athlete relationship quality, resilience characteristics, and transformational leadership. These scores served as pivotal reference points for conducting subsequent statistical evaluations. The Pearson correlation coefficient, employed within the SPSS 25 software, was deployed to quantitatively scrutinise the magnitude and direction of associations between the distinct variables, thereby shedding light on the intricate relationships encapsulated within the dataset. To delve further into the complex web of relationships, mediation analyses of contemporary approaches suggested by many studies were executed [28, 29]. This methodological framework aimed to systematically investigate the potential mediating role of transformational leadership in the relationship between resilient characteristics and coach-athlete relationship quality. Preacher and Hayes [28] suggest that a mediated effect can be seen as a specific case of indirect effects, typically involving only one intervening variable. However, it is essential to note that concluding the presence of a mediation effect implies that there was an initial total effect of X on Y. This assumption does not apply when assessing indirect effects. Discovering a significant indirect effect is possible even without a significant total effect. To determine whether this effect truly represents mediation, one should evaluate the total effect thoroughly. Based on these suggestions, we used the bootstrapping method [29, 30]. By the contemporary approach in statistical mediation analysis, the significance of the product of coefficients a and b (a.b) as determined through bootstrapping analysis provides grounds for inferring the significance of the mediation model or the indirect effect. In this context, no further conditions or prerequisites need to be met to establish the significance of the mediation. This approach underscores the importance of the a.b product as a robust indicator of the mediating role without necessitating additional criteria or assumptions [31]. We can apply a contemporary approach to assess mediating effects, considering the following key points (see Gürbüz & Bayık for details):

(a) Statistical significance in the total effect (c) is not a strict requirement. Even if the total effect is not statistically significant, the indirect effect can still achieve statistical significance. (b) There is no necessity for the effect of the independent variable (Coach-Athlete Relationship Quality, X) on the mediator (Transformational Leadership, M), as represented by the path "a," to be statistically significant. (c) Non-Significance of Path b': Similarly, it is not essential for the effect of the mediator

(Transformational Leadership, M) on the dependent variable (Team Resilience, Y) when controlling for X, represented by path “b,” to be statistically significant. (d) Instead of categorising mediation as full or partial, it is more appropriate to quantify the direct, indirect, and total effects precisely. This approach provides a more accurate understanding of the underlying dynamics of the mediation model. (e) The direct and total effects may not exhibit statistical significance, while the indirect effect remains statistically significant. Therefore, the absence of statistical significance in the direct effect and/or total effect does not affect the conclusion regarding the statistical significance of the mediation model. (f) To assess the significance of the indirect effect, it is recommended to employ bootstrapping or, at the very least, the Monte Carlo method [32]. The traditional Sobel Test is no longer considered the preferred method. (g) The only requirement is to confirm a significant indirect effect to determine the statistical significance of a mediation model. Suppose the product of coefficients a and b (a.b) achieves statistical significance through bootstrapping analysis. In that case, concluding that the tested mediation model is statistically significant without imposing additional conditions is valid.

As Mardia’s coefficient was 20.18 with a critical ratio of 26.70, data depart from multivariate normality. Therefore, we operate the bootstrapping method procedure with 5000 bootstrap replication samples to calculate more accurate parameter estimates [33].

Results

Table 1 illustrates the associations among Coach-Athlete Relationship Quality (CARQ), Resilient Characteristics (DRC), Acceptance of Group Goals (AGG), Appropriate

Role Model (ARM), Contingency Reward (CR), High-Performance Expectation (HPE), Individual Consideration (IC), Inspirational Motivation (IM), and Intellectual Stimulation (IS) variables. All variables demonstrated positive correlations, indicating the suitability of conducting mediation analyses. The correlation coefficients observed between the study variables ranged from low to moderate levels. Specifically, CARQ exhibited positive correlations with DRC ($r=0.60, p<0.01$), AGG ($r=0.68, p<0.01$), ARM ($r=0.64, p<0.01$), CR ($r=0.62, p<0.01$), HPE ($r=0.56, p<0.01$), IC ($r=0.64, p<0.01$), IM ($r=0.62, p<0.01$), and IS ($r=0.54, p<0.01$). The dimensions within the Transformational Leadership Inventory (TLI) displayed the anticipated positive correlations with one another, reinforcing the construct’s internal consistency. DRC exhibited positive correlations with AGG ($r=0.47, p<0.01$), ARM ($r=0.46, p<0.01$), CR ($r=0.41, p<0.01$), HPE ($r=0.49, p<0.01$), IC ($r=0.37, p<0.01$), IM ($r=0.43, p<0.01$), and IS ($r=0.36, p<0.01$). We conducted mediation analyses to explore each dimension of the Differentiated Transformational Leadership Inventory (DTLI) as a mediator variable between CARQ and DRC. Interestingly, except for HPE, all dimensions of DTLI yielded statistically insignificant indirect effects within their respective models. In other words, the indirect effects between CARQ and DRC through AGG, ARM, CR, IC, and IS were not statistically significant despite having significant coefficients in paths (a) and (b).

Figure 2 presents the unstandardised coefficients depicting CARQ, HPE, and DRC relationships. It is noteworthy that CARQ exhibited an indirect effect on DRC through HPE, and this discovery achieved statistical significance ($p<0.05, CI\% = 0.02-0.27$). Furthermore, the direct influence of the coach-athlete relationship on team

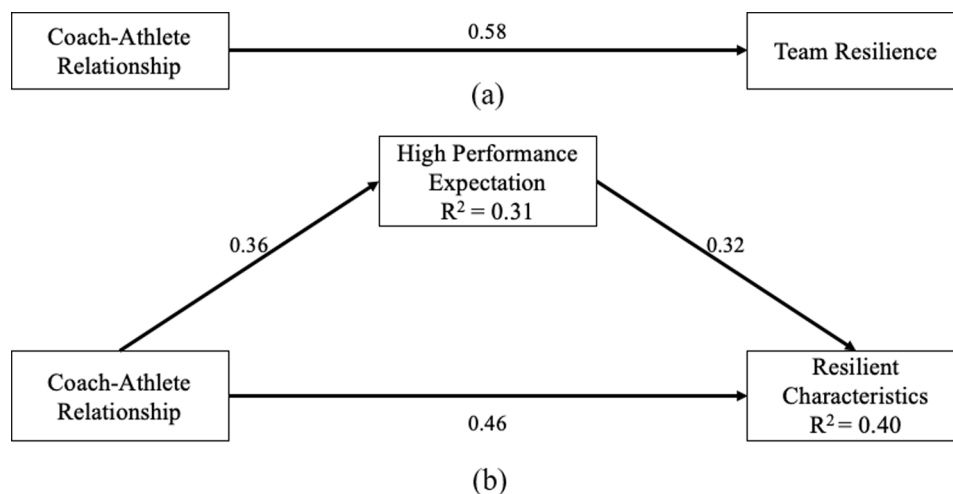


Fig. 2 (a) Total effects of coach-athlete relationship quality on team resilience in sport. While the presence of a significant total effect of CARQ on DRC is not a prerequisite for mediation analysis, it is beneficial to illustrate the linear association between these variables.(b) This elucidation enhances our comprehension of the role of High-Performance Expectations (HPE) in mediation analysis. The indirect effect of coach-athlete relationship quality on displaying resilient characteristics through high-performance expectation. Note: The unstandardised coefficients for each effect are reported

resilience among professional football players was also statistically significant ($\beta = 0.464, p < 0.01$). Of particular note is the positive path coefficient observed between the coach-athlete relationship and High-Performance Expectation (path a) ($\beta = 0.369, p < 0.01$). Moreover, the indirect effect between the coach-athlete relationship and team resilience was quantified at 0.118, and its statistical significance was confirmed as the confidence interval did not encompass zero (For detailed statistics, please refer to Table 2).

Table 2 comprehensively examines the direct and indirect effects of coach-athlete relationship quality on resilient characteristics.

Regarding the indirect effects, it is evident that the Coach-Athlete Relationship significantly positively influences the Displaying of Resilient Characteristics ($\beta = 0.11^{**}, p < 0.01$), signifying that this relationship quality contributes positively to developing resilient traits among individuals. This finding is consistent with the standardised estimate, reinforcing the observed effect's robustness ($\beta = 0.11^{**}$).

Moving on to the direct effects, several noteworthy relationships emerge:

Coach-Athlete relationship and high-performance expectation

A statistically significant direct effect exists between Coach-Athlete Relationship and High-Performance Expectation ($\beta = 0.36^{**}, p < 0.01$). This suggests that a solid coach-athlete relationship is positively associated with higher expectations for high performance. The standardised estimate further emphasises the substantial impact of this relationship ($\beta = 0.56^{**}$).

Coach-athlete relationship and displaying resilient characteristics

The direct effect between Coach-Athlete Relationship and Displaying Resilient Characteristics is statistically significant ($\beta = 0.46^{**}, p < 0.01$), indicating that a positive

coach-athlete relationship is linked to a greater display of resilient traits among individuals. The standardised estimate further supports this relationship ($\beta = 0.48^{**}$).

High-performance expectation and displaying resilient characteristics

Another significant direct effect is observed between High-Performance Expectation and Displaying Resilient Characteristics ($\beta = 0.32^{**}, p < 0.01$). This implies that individuals with higher expectations for high performance tend to exhibit more resilient characteristics. The standardised estimate highlights the strength of this association ($\beta = 0.21^{**}$).

The table underscores the multifaceted relationships between coach-athlete relationship quality, high-performance expectations, and the display of resilient characteristics. It reveals that a positive coach-athlete relationship not only directly contributes to displaying resilient characteristics but also indirectly influences these characteristics through its positive impact on high-performance expectations.

Discussion and conclusions

In an attempt to expand our knowledge around transformational leadership in sport, the aims of the present study were two-fold: (a) to investigate the interconnections between the quality of coach-athlete relationships and team resilience within the context of football teams and (b) to delve into whether the concept of transformational leadership mediates the relationship between the quality of coach-athlete relationships and team resilience in football.

Firstly, it was found that football players who perceived themselves as close committed to their coach and their coach as complementary are likelier to perceive their teams as displaying resilient characteristics. These results are consistent with similar research in sports, indicating that athletes with high-quality relationships with their coaches can perceive their team as more resilient [20, 35–37]. For instance, Erdner [34] delved into NCAA Division I student-athletes' perceptions of how the coach-athlete relationship shapes student-athlete resilience, echoing our study's emphasis on the importance of this relationship in building resilience. Similarly, Moen et al. [36] explored the working alliance within the coach-athlete relationship and its impact on athlete burnout, highlighting the interconnectedness of athlete well-being and coach dynamics. Furthermore, Gabana et al. [20] engaged in a positive psychology intervention with youth athletes, revealing that coach participation in such programs can enhance athletes' gratitude and potentially contribute to their overall resilience.

Additionally, Kim and Sun-Lyong [35] examined the roles of youth athletes' resilience in the context of

Table 2 Direct and indirect effects of coach-athlete relationship quality on resilient characteristics

| Indirect effect | | | |
|------------------------------|--------------------------------------|--------------------------|------------------------|
| Independent Variable | Dependent Variable | Unstandardized estimates | Standardized estimates |
| Coach-Athlete Relationship | Displaying Resilient Characteristics | 0.11** | 0.11** |
| Direct Effect | | | |
| Coach-Athlete Relationship | High-Performance Expectation | 0.36** | 0.56** |
| Coach-Athlete Relationship | Displaying Resilient Characteristics | 0.46** | 0.48** |
| High-Performance Expectation | Displaying Resilient Characteristics | 0.32** | 0.21** |

coach-athlete relationships and burnout, further emphasising the relevance of resilience in sports settings. These findings provide some evidence of the potential influence of coach-athlete relationship quality on team resilience within the context of football. However, it is essential to acknowledge that the relationship between coach-athlete dynamics and team resilience is complex and multifaceted, with various factors and contextual elements contributing to this phenomenon. Elements such as communication style, leadership approach, and team culture play significant roles, with effective communication and transformational leadership enhancing resilience, while external pressures and negative team culture can undermine it. The individual characteristics of athletes, such as their personality, motivation, and previous experiences, can significantly influence how they perceive and respond to coaching, thereby impacting the overall team resilience. External factors like organisational support, media pressure, and public expectations can either bolster or strain the coach-athlete relationship, further affecting the team's ability to maintain resilience in challenging situations. Further research is needed to explore these dynamics comprehensively and understand the intricate interplay between coach-athlete relationships, individual perceptions, and team-level characteristics to inform more effective coaching practices and team development strategies in football.

Furthermore, this research aligns with the expanding body of empirical findings consistently demonstrating favourable associations between coach leadership behaviours and the coach-athlete relationship quality [10, 11, 38–41]. Vella et al. [42] found a moderate and positive relationship between coach-athlete relationships and transformational leadership in their study on the relationship between coach leadership, coach-athlete relationship, team success, and positive developmental experiences of adolescent soccer players. In other words, coaches' transformational leadership behaviours positively impact the relationship between coaches and athletes. The purpose of Gorgulu's [43] study with college basketball players was to examine the relationship between transformational leadership behaviour (i.e., individual consideration) and extra effort inspired by the leader, as well as to explore the mediating role of the coach-athlete relationship (closeness). Specifically, it was assumed that closeness (coach-athlete relationship) would fully mediate the relationship between transformational leadership behaviour and extra effort inspired by the leader. The results showed that transformational leadership was positively associated with extra effort inspired by the leader and that closeness partially mediated this relationship among college basketball players. Radzi et al.'s [44] study investigated the perceptions of transformational leadership and the quality of coach-athlete

relationships among athletes in different sports. A relationship was also found between the coach-athlete relationship and transformational leadership.

The findings of this study highlight a crucial aspect of athlete-coach dynamics and its potential impact on athletes' resilient characteristics. When athletes perceive their coaches' expectations as motivating and attainable, it implies that coaches are setting performance standards that athletes believe they can meet and that these standards serve as a source of inspiration [45]. Moreover, the observed reciprocal enhancement of resilient characteristics suggests a possible feedback loop in which high-performance expectations from coaches drive athletes to develop greater resilience. This can be linked to Bandura's social cognitive theory, where self-efficacy beliefs—individuals' beliefs in their capabilities to achieve specific goals—play a central role [46]. When athletes perceive that they can meet their coaches' expectations, their self-efficacy beliefs are reinforced. This increased self-efficacy can, in turn, contribute to greater resilience, as individuals who believe in their ability to overcome challenges are more likely to exhibit resilient behaviours.

Furthermore, the study's implications extend to positive psychology in sports. Positive psychology emphasises the role of strengths and positive emotions in enhancing performance and well-being. The findings suggest that coaches who effectively communicate high-performance expectations may create a positive and empowering psychological environment for their athletes. This aligns with the broaden-and-build theory, suggesting that positive emotions, such as motivation and self-belief, can broaden individuals' mindsets and build enduring personal resources like resilience [47].

This study underscores the importance of coaches' high-performance expectations and their potential to influence athletes' resilient characteristics. When coaches set challenging yet attainable standards, athletes may respond with increased resilience, better coping mechanisms, and an enhanced likelihood of achieving their desired athletic outcomes. These findings provide valuable insights into the psychological mechanisms underlying coach-athlete interactions and their implications for athlete development and performance.

One notable limitation of this study is its correlational design, which prevents the establishment of causality between the variables. While the relationships among coach-athlete relationship quality, transformational leadership, and team resilience can be identified, the study cannot determine whether changes in one variable directly cause changes in another. This limitation implies that the findings should be interpreted cautiously, particularly regarding their implications for practice and future research. Additionally, the study's cross-sectional nature restricts the ability to observe changes over time.

Since data were collected at a single point, tracking the development or fluctuations in the variables of interest is impossible. Future research using longitudinal designs could provide deeper insights into how these relationships evolve and contribute to a more comprehensive understanding of the dynamics at play.

Future implications

In this study, we embarked on a journey to explore the intricate relationship between the quality of coach-athlete relationships, transformational leadership style, and team resilience in elite football players. Our research aimed to shed light on these dynamic interactions within the context of football teams and to uncover the potential mediating role of transformational leadership in shaping the connection between coach-athlete relationships and team resilience. One notable result is that within our analysis, except for the dimension of “high-performance expectation,” other dimensions of the mediation model yielded an insignificant indirect effect of the coach-athlete relationship on team resilience when each dimension was added as a mediator. However, these dimensions were positively correlated with study variables. This finding presents an intriguing avenue for future research.

As we move forward, several avenues for future research can expand upon our findings. (a) Longitudinal studies can track the development of coach-athlete relationships, transformational leadership behaviours, and team resilience over time. This would provide a deeper understanding of the causal relationships and how they evolve. (b) Investigating the effectiveness of intervention programs to enhance coach-athlete relationships and promote resilience within football teams would be beneficial. Such programs could be valuable for coaches and athletes alike. (c) It is essential to explore how cultural and contextual factors influence the dynamics between coaches and athletes and how these variations may impact team resilience. This could be done by conducting cross-cultural studies that compare how different cultural contexts shape coach-athlete interactions and team resilience or by using mixed-methods approaches to understand the specific cultural and environmental factors that play a role. Additionally, case studies focusing on teams from diverse cultural backgrounds could offer in-depth insights into how these factors influence the effectiveness of leadership styles and the strength of team resilience.

Our study provides a foundational understanding of the interplay between coach-athlete dynamics, transformational leadership, and team resilience in elite football. The future research directions outlined above can further enrich this knowledge and help develop effective coaching practices in football and beyond.

Author contributions

We declare that this manuscript is original, has not been published before, and is not currently being considered for publication elsewhere. We confirm that the manuscript has been read and approved by all named authors and that no other persons satisfied the criteria for authorship but are not listed. We further confirm that we have all approved the authors' order listed in the manuscript. EK reviewed the literature and prepared the conceptual framework. IA has designed the research and wrote the main manuscript. ES conducted the analysis and wrote the results.

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Data availability

We confirm that the data used in the research are available. The data can be obtained by emailing the corresponding author.

Declarations

Ethical approval

The Canakkale Onsekiz Mart University Scientific Research Ethical Committee reviewed and approved all procedures on 02.11.2020 (Protocol No: 2020/127) prior to recruitment and data collection.

Informed consent

All participants were fully informed about the process and purpose of the study, and written consent/assent was obtained.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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