



Expectations and Evaluation of Volunteers' Experience at the Paralympic Swimming European Championship

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- A) conception and design of the study
- B) acquisition of data
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Abstract

The high rate of young athletes dropping out of sports encourages researchers to understand the causes of this phenomenon and analyse the factors that can increase the retention of young athletes in sports. Engagement is associated with more positive outcomes, and lower risks of dropping out of the sport and burnout. Therefore, studying engagement can provide deeper insights into young people's behaviour in sports. Youth sports coaches have a significant influence on shaping young athletes' experiences and fostering their positive development. Studies highlight the impact of coach behaviour and the quality of athlete-coach interactions on athlete engagement. Research on young athletes' perceptions of coaching effectiveness can enhance coaching practices and boost athlete engagement. This study investigated young volleyball players' engagement in sport, perceived coaching effectiveness, and links between the components. The study sample included 317 volleyball players between the ages of 12 and 19. Data were gathered through an anonymous questionnaire survey. The results revealed that athlete engagement has a weak statistically significant correlation with perceived coaching effectiveness. There were no significant differences in sports engagement variables regarding age and sex, except females reported higher scores in the variable Dedication to sport compared to males. Finally, female athletes rated significantly higher on overall coaching effectiveness and motivation compared to male athletes. Younger athletes scored substantially higher in motivation compared to older athletes. Also, athletes aged 12–14 years rated significantly higher on overall coaching effectiveness compared to athletes aged 17–19 years.

Keywords: young athletes, team sport, volleyball, engagement, coach

Introduction

Studies indicate that sports play a crucial role in the positive development of young people. Engaging in sports enhances their social, physical, and psychological well-being while also fostering social relationships and promoting healthy lifestyles, particularly during adolescence (Eime et al., 2013). Although sports offer numerous benefits, a significant number of young people discontinue their

participation (Battaglia et al., 2024), with dropout rates peaking among athletes aged 14 to 17 (Múgica Corrales & Olaya-Cuartero, 2022). Moreover, only a small fraction of children who specialise in sports at an early age attain elite status, as most drop out before reaching that level (Malina, 2010). Although young athletes of both sexes have high dropout rates from sport, studies (Múgica Corrales & Olaya-Cuartero, 2022; Latorre-Roman et al., 2018) show that girls exceed boys in attrition rate. While

researchers (Battaglia et al., 2024) advocate for a more critical perspective on sports dropout, challenging the idea that organised sports participation is inherently ‘good’ and dropping out is intrinsically ‘bad’, it remains important to explore strategies for keeping young people engaged in sports for longer. In particular, examining the coach’s role and behaviours in shaping athletes’ experiences is crucial.

One way to reduce the intention to give up sports is to increase engagement in sporting activities (De Francisco et al., 2020). Engagement as an activity is one of the most essential prerequisites for high performance, i.e., for professional and novice youth athletes. Athlete engagement is a long-term, relatively stable sporting experience, signifying the overall positive effects of sport and sports cognition (Hodge et al., 2009). Athlete engagement has been linked to several positive outcomes, including increased perseverance and a reduced risk of burnout (DeFreese & Smith, 2013). Therefore, it is essential for coaches to foster athlete engagement and understand the factors that enhance the likelihood of sustained participation.

A key predictor of sustained youth engagement in sports is the development of positive emotions associated with participation (Martins et al., 2014). Coaches play a crucial role in shaping athletes’ sporting experiences (Occhino et al., 2014) and are instrumental in fostering their development. The primary objective of a sports coach is to support athletes’ growth, enhance all aspects of their performance, and help them reach their full athletic potential (Lyle & Cushion, 2016). A coach’s characteristics, emotional responses, and behaviour significantly impact athletes’ performance (Cook et al., 2021; Yang et al., 2015). The quality of coach-athlete interactions shapes both parties’ perceptions of their relationship and affects the benefits derived from it, ultimately influencing athlete engagement (Gu et al., 2023). A strong coach-athlete relationship is fundamental to a positive sports experience and is regarded as a crucial element of effective coaching (Jowett, 2017). There is evidence that athletes’ satisfaction with their coach are correlated with athletes’ perceptions of coaching effectiveness (Boardley et al., 2015), which may have implications for athletes’ engagement and long-term involvement in sport.

Coaching effectiveness reflects a coach’s ability to apply their knowledge and skills to positively impact athletes’ learning and engagement (Mohd Kassim et al., 2020). Research (Broodryk et al., 2014; Chao et al., 2023; Kavussanu et al., 2008) highlights a distinction between coaching efficacy – coaches’ self-perceived competence – and coaching effectiveness, which is based on athletes’ perceptions of their coaches’ abilities. Kavussanu et al. (2008) emphasise that athletes’ perceptions of their coaches’ behaviour serve as a crucial mediator between coaching behaviour and athlete performance. The developmental stage between ages 13 and 19, marked by increased

training intensity and competition, is considered a pivotal period in an athlete’s career progression (Wylleman et al., 2013). Therefore, coaches must understand athletes’ expectations to foster strong relationships and support them in achieving their goals. Research on young athletes’ perceptions of coaching effectiveness can contribute to improving coaching practices and enhancing athlete engagement in sports. Rather than the coach’s behaviour, what matters more is how athletes perceive, interpret, and evaluate these actions, as the specific context shapes their experiences (Gjesdal et al., 2019).

Athlete Engagement

The positive adolescent experience of sport can be conceptualised through the concept of engagement. Engagement is a psychological construct representing an individual’s interest in and connection to an activity, encompassing three key components: emotional, behavioural, and cognitive engagement (De Vreede et al., 2019). In sports, engagement is regarded as one of the most desirable experiences athletes can cultivate through their participation. Engagement is not considered a transient state but rather a prolonged experience encompassing fundamental dimensions that extend throughout an athlete’s involvement in sports (Lonsdale et al., 2007a). This study is based on Lonsdale et al.’s (2007b) conceptualisation of engagement, which defines it as a sustained, positive cognitive and emotional involvement in sports characterised by confidence, dedication, enthusiasm, and vigour. According to these scholars, confidence denotes an athlete’s belief in their ability to perform at a high level and achieve desired outcomes. Dedication reflects the commitment to investing time and effort in pursuing personally significant goals. Vigour represents an athlete’s sense of physical, mental, and emotional energy, while enthusiasm encapsulates the excitement and a high degree of enjoyment in sporting activities.

The most widely accepted framework for explaining athlete engagement is the Self-Determination Theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017). This theory underscores the fulfilment of fundamental psychological needs – autonomy, competence, and relatedness – as essential for optimal athlete functioning. A core principle of SDT posits that an environment that satisfies these needs influences the extent to which individuals experience autonomous motivation, ultimately leading to positive psychological outcomes such as engagement. In the context of sports, the coach plays a pivotal role in shaping the training environment to support athletes’ needs. There is a large body of evidence on the influence of an enabling environment on a range of positive outcomes, including engagement (Curran et al., 2015;

Francisco et al., 2020; Hodge et al., 2009), well-being and performance (Lemelin et al., 2022), and interpersonal relationships (Camiré et al., 2019; Jowett et al., 2017). Raimundi et al. (2023) identified athletes' perceptions of the motivational climate as the strongest predictor of engagement.

Coaches serve as a crucial source of social, emotional, and informational support for athletes. Their influence on athlete engagement is substantial and cannot be overlooked (Gu et al., 2023). In the context of sports, coaches play a pivotal role in shaping young athletes' experiences and fostering their positive development. A strong coach-athlete relationship facilitates effective collaboration, enabling athletes to receive adequate knowledge, guidance, and social, emotional, and informational support. This, in turn, enhances athletes' sense of security and engagement, encouraging their enthusiastic participation in training and competitions (Guo et al., 2022; Jowett, 2017; Ye et al., 2016). It is important to emphasise that the fulfilment of psychological needs is fundamental to fostering optimal motivation. A supportive social environment that satisfies these needs can enhance the quality of motivation, thereby promoting greater engagement. Engagement is characterised by positive emotions and high motivation to participate in sports and achieve goals (Graña et al., 2021). It is important not to confuse engagement with motivation but rather to consider it a precondition for engagement, as motivation is insufficient to keep learners engaged (Hastie et al., 2020).

Research on athlete engagement suggests that higher levels of engagement contribute to various positive outcomes, including increased attendance (Graña et al., 2021), enhanced exercise performance (Rusmanto, 2023), greater enjoyment and satisfaction in sports, and heightened motivation (Raimundi et al., 2023). Additionally, engagement has been found to reduce the risk of burnout and dropping out of sports (De Francisco et al., 2020). Furthermore, athlete engagement is associated with key psychological attributes, such as mental toughness (Jaramillo-Tapia et al., 2024), motivation (Podlog et al., 2015; Raimundi et al., 2023), and flow experiences (Hodge et al., 2009).

It should be noted that the results of studies on the impact of sex, age, level of competition and other demographic variables on engagement are mixed. Some studies suggest that sex (Martins et al., 2015; Raimundi et al., 2024), age (Daraškevičiūtė and Poteliūnienė, 2022; Raimundi et al., 2024) and competitive level (Babić et al., 2015; Raimundi et al., 2024) may influence athletes' engagement. However, some researchers do not capture differences in athletes' engagement in terms of sex (Babić et al., 2015). Thus, it is relevant to elucidate further the differences in athletes' engagement in relation to different sociodemographic variables.

Coaching Effectiveness

Coaches play a crucial role in enhancing athletes' physical performance and supporting their mental and social development. Therefore, it is essential for coaches to demonstrate effectiveness across all aspects of coaching, extending beyond athletic performance to influence various dimensions of the sporting experience. Effective sports coaching is characterised by the ability to adopt behaviours that optimise athlete learning and performance, highlighting the specialised skills coaches bring to their role (Horn, 2008).

Coaching effectiveness is a widely used term in the sports coaching literature; however, it remains conceptually ambiguous and lacks a universally accepted definition. Lyle (2020), in her analysis of the term, concludes that coaching effectiveness serves as an overarching label encompassing multiple concepts and sub-processes and is best understood as a contextualised and multi-layered construct. Côté and Gilbert (2009) define coaching effectiveness as "the consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character within specific coaching contexts" (p. 316). They emphasise the importance of distinguishing between coaching expertise, coaching effectiveness, effective coaching, and expert coaches. According to their framework, coaching expertise refers to specialised knowledge within a given coaching context. Effective coaches are those who successfully apply and adapt their coaching experience to specific athletes and situations to maximise learning outcomes, thereby demonstrating coaching effectiveness, which is typically measured by athlete performance. In contrast, expert coaches are those who sustain coaching effectiveness over an extended period, consistently fostering athlete development and performance.

Horn (2008) developed the coaching effectiveness model, which underscores the pivotal role of athletes' perceptions of coach behaviour in determining coaching effectiveness. According to this model, coaching effectiveness is influenced not only by successful athletic performance but also by athletes' positive psychological responses to their coach. Horn (2008) highlights both the direct and indirect effects of coach behaviour, proposing a complex process through which coaches impact athletes' cognitive and behavioural development. A key aspect of this model is the recognition that athletes perceive and interpret coaching behaviour in individualised ways. As a result, the same coaching behaviour may have varying effects on different athletes, influencing their self-perception, performance, and overall behaviour in distinct ways. This perspective reinforces the importance of considering individual athlete responses when assessing coaching effectiveness.

Although coach behaviour and performance have been extensively examined in the research, studies focusing on athletes' perceptions of coaching effectiveness remain limited. Research on this topic has been conducted by Boardley et al. (2008), Broodryk et al. (2014), Mohd Kassim and Boardley (2018), and Kavussanu et al. (2008). Previous studies indicate that coaches and athletes often have differing perceptions of coaching effectiveness, with coaches generally rating themselves higher than their athletes do (Broodryk et al., 2014; Kavussanu et al., 2008; Teatro et al., 2017; Chao et al., 2023).

The findings highlight the relationship between perceived coaching effectiveness and various aspects of athlete personal development and coach-athlete interactions. Research by Mohd Kassim and Boardley (2018) found that athletes' perceptions of their coach's motivational effectiveness positively predicted their sports confidence and the quality of their relationship with the coach. Additionally, athletes' perceptions of their coach's technique effectiveness were positively associated with their sports competence. In contrast, a study by Malete et al. (2013) found that athletes' perceptions of their coach's game strategy competence were a significant predictor of self-reported aggression and peer cheating among players. These findings suggest that coaching effectiveness can have both positive and potentially negative influences on athlete behaviour, reinforcing the need to carefully consider how coaching strategies impact athlete development and ethical conduct in sports.

Given that athletes' perceptions of coaching effectiveness are linked to and predictive of various outcomes related to physical, mental, and social development, such research is particularly relevant in the context of youth sports. Understanding how coaching behaviour shapes a positive sporting experience is essential for ensuring adolescents remain engaged in sports into adulthood.

Research Objectives and Hypotheses

Withdrawal from sports is most strongly related to the constructs of motivation and overall sports experience (Back et al., 2022), and increasing athlete engagement, which represents an athlete's long-term positive cognitive and emotional experiences of sport, is considered to be one way of reducing intentions to withdraw from sport (De Francisco et al., 2020). Therefore, understanding the antecedents of engagement may be important in addressing the retention of young athletes to ensure that they do not fall away on their way to senior level and achieve success. Research on sports engagement can contribute to a better understanding of young people's sporting behaviour and help develop similar experiences related to youth development and health. When investigating the

phenomenon of engagement, researchers have analysed various aspects of engagement related to socio-contextual factors, mainly focusing on the motivational climate created by the coach (Raimundi et al., 2023), the quality of interpersonal relationships (Cahyono et al., 2023; Curran et al., 2015), coaching leadership style (Longakit et al., 2024), and the influence of psychological need satisfaction (De Francisco et al., 2020; Hodge et al., 2009; Jowett et al., 2016) on engagement. However, there is a lack of research examining how coaching competence, particularly athletes' perceptions of coaching effectiveness, relates to engagement. Investigating coaching effectiveness is essential to optimising athletes' sports experiences and overall development. Findings by Mohd Kassim et al. (2018) highlight the significance of athletes' perceptions of their coach's effectiveness in fostering competence, connection, confidence, and character. Examining these aspects is particularly important, as studies such as Kavussanu et al. (2008) suggest that coaches' and athletes' views on coaching effectiveness often differ and may be influenced by factors such as the athlete's gender, skill level and sporting experience. Coaches need to use athletes' perceptions of coaching effectiveness as social signals that could determine the extent to which athletes believe in their coaches' abilities and perceive the effectiveness of their coaching (Chao et al., 2023). Research on young athletes' perceptions of coaching effectiveness can help improve coaching practices and promote a more positive sporting experience, increasing athlete engagement.

This study aims to examine young volleyball players' engagement in sports, their perceptions of coaching effectiveness, and the relationship between these two components. Additionally, the study seeks to explore differences in engagement and perceived coaching effectiveness based on sex and age. Building upon the reviewed literature, the study proposes the following hypotheses:

H1: There will be significant differences based on age, with younger athletes scoring higher on engagement and perceived coaching effectiveness;

H2: There will be significant differences based on sex, with male athletes scoring higher on engagement and perceived coaching effectiveness;

H3: Athletes who perceive their coach as highly effective are expected to exhibit greater levels of engagement in sports.

Materials and Methods

Research design

The study was carried out using a quantitative research strategy. Quantitative research seeks to understand social phenomena through measurable variables and quantifiable data. This research strategy is suitable for testing objective

theories using variables that can be measured and analyzed using statistical procedures (Creswell, 2018). The chosen quantitative research strategy allows the provision of valid and reliable data that can reveal trends in young athletes' engagement and perceived coaching efficacy, clarify their interrelationships, provide further research directions, and make recommendations for sports practice.

Participants

The population of this study consisted of athletes aged 12–19 years old attending volleyball training in various Lithuanian sports schools and clubs. According to data from the Official Statistics Portal of Lithuania for 2021 (<https://osp.stat.gov.lt/lietuvos-svietimas-kultura-ir-sportas->), volleyball ranks third after basketball and football among team sports in terms of the number of athletes in Lithuania. During the study period, official data from the Lithuanian Volleyball Federation indicated that there were 1357 volleyball players aged between 12 and 19 years old, including 501 (36.9%) males and 919 (63.1%) females, playing in Lithuanian sports schools and sports clubs. Using a 95% confidence level and a 5% margin of error, it was estimated that the sample should consist of at least 300 athletes. In our study, 317 athletes aged 12–19 participated, 121 (38.2%) males and 196 (61.8%) females. The response rate was 23.4%. Fosnacht et al. (2017) found the estimates based on the data remained reliable even with a 20%–25% response rate with a sample size of less than 500. Thus, the sample size used in this study allows us to substantiate the reliability of the data estimates. Three age groups were identified for the analysis of the results: 12–14 years ($N = 126$; 39.7%), 15–16 years ($N = 113$; 35.6%) and 17–19 years ($N = 78$; 24.6%). The distribution of the subjects according to the number of years of participation in sport was as follows: less than 1 year – 10.1%, 1–6 years – 73.8%, and more than 6 years – 16.1%. Additionally, athletes were required to categorise themselves into one of the following groups based on their level of athletic proficiency: international – representing the national team or being a candidate for selection; national – competing in the Lithuanian Volleyball Championship; club – participating in local and international tournaments; and recreational – not engaged in competitive events. 49.2% of the participants attended volleyball training in the five major cities of Lithuania, 50.8% in other cities and towns.

Instrumentation

In this study, data were collected using two Likert-type scales: the Athlete Engagement Questionnaire (AEQ) and the Coaching Efficacy Scale (CES). The AEQ, developed by Lonsdale et al. (2007b), consists of 16 items distributed across four dimensions: *Confidence*, *Dedication*, *Vigour* and *Enthusiasm*. Examples of items include: “I believe I am capable of accomplishing my goals in sport” for

the Confidence subscale, “I want to work hard to achieve my goals in sport” for Dedication, “I feel energised when I participate in my sport” for Vigour, and “I enjoy my sport” for Enthusiasm. Responses were measured on a 5-point Likert scale, ranging from 1 (almost never) to 5 (almost always), indicating how frequently athletes had experienced these feelings over the past three months. The internal consistency of the AEQ, as assessed by Cronbach's alpha, was 0.89, with reliability values of 0.72 for *Confidence*, 0.81 for *Dedication*, 0.86 for *Vigour*, and 0.78 for *Enthusiasm*. The internal consistency of the Lithuanian version of the AEQ used in Daraškevičiūtė's and Poteliūnienė's (2022) study was high, with a Cronbach's alpha of 0.934 for the overall scale and reliability coefficients of 0.833 to 0.889 for the individual subscales.

The Coaching Effectiveness Scale (Boardley et al., 2008; Kavussanu et al., 2008) has been used to measure athletes' perceptions of coach effectiveness. The CES comprises 24 items, measuring four dimensions of perceived coaching effectiveness: *Motivation* (7 items), *Game Strategy* (7 items), *Technique* (6 items), and *Character Building* (4 items). Examples of items from each subscale include: “Motivate his/her athletes” for the Motivation subscale, “Adapt to different game situations” for Game Strategy, “Coach individual athletes on technique” for Technique, and “Instill an attitude of good moral character” for Character Building. Responses were recorded on a 10-point Likert scale, ranging from 0 (not at all effective) to 9 (extremely effective). Participants were asked to evaluate various aspects of their coach's effectiveness by responding to prompts such as “How effective is your coach in his/her ability to...”. In this study, the internal consistency of the CES was found to be high, with a Cronbach's alpha of 0.96 for the overall scale and reliability coefficients of 0.93 for *Motivation*, 0.89 for *Game Strategy*, 0.88 for *Technique*, and 0.88 for *Character Building*.

Procedures

Prior to conducting the research, ethical approval was obtained from the authors' institution to ensure compliance with ethical standards. Additionally, permission to conduct the study was secured from nine sports schools and three sports club administrators. Following this approval, the first author established contact with the senior management of the selected sports schools and clubs. Before data collection, parents were informed about the study through sports school administrators and parental consent was obtained. The research data were collected using the online survey platform www.apklausa.lt, with volleyball coaches working with athletes aged 12–19 years distributing the survey link to their players. Participation in the study was voluntary, and all ethical guidelines were strictly adhered to, ensuring the protection of participants' rights and confidentiality.

Data Analysis

Cronbach's alpha coefficient was calculated to assess the internal consistency of the dimensions within each scale. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were utilised to summarise the data. To examine the normality of distribution, Kolmogorov-Smirnov tests were conducted. Since the data did not meet the assumptions of a normal distribution, nonparametric statistical methods were applied. To compare differences between two independent groups based on sex, the Mann-Whitney U test was used. Differences among three age groups were analysed using the Kruskal-Wallis H test, as this test does not assume normality and allows for the identification of statistically significant differences between groups. When statistically significant differences between age groups were identified, Dunn's post hoc test with Bonferroni adjustment was applied for pairwise comparisons to determine significant differences between specific age groups.

Differences between groups were considered statistically significant at $p \leq 0.05$. Arithmetic means (M), standard deviations (SD), and mean ranks (MR) were calculated to summarise the data. To examine the relationships between study variables, Spearman's rho (ρ_s) coefficient was used. The interpretation of the correlation followed the guidelines proposed by Gonestas and Strielciunas (2003).

All statistical analyses were performed using SPSS 28.0 software.

Results

The Kruskal-Wallis H test was conducted to examine differences between age groups regarding individual AEQ variables and the total AEQ scale. The results indicated that no statistically significant differences were found across age groups for any of the AEQ variables or the overall scale: *Confidence* ($H = 0.68$; $p = 0.711$), *Dedication* ($H = 4.48$; $p = 0.106$), *Vigour* ($H = 2.79$; $p = 0.247$), *Enthusiasm* ($H = 1.06$; $p = 0.588$), and overall scale ($H = 0.44$; $p = 0.802$). Moreover, Table 1 presents the data on sports engagement variables in the function of sex, i.e. males and females. The sex-specific variables of the young volleyball players' engagement in sports are presented. The Mann-Whitney U test revealed that females scored significantly higher than males on the *Dedication* variable, indicating a statistically significant difference between the two groups ($U = 9916.50$; $p = 0.013$). The Mann-Whitney U test revealed that there were no statistically significant differences between males and females in the *Confidence* variable ($U = 10701.00$; $p = 0.141$), *Vigour* ($p = 0.130$) and *Enthusiasm* ($U = 10605.50$; $p = 0.106$), and when comparing the AEQ ($U = 10916.50$; $p = 0.234$).

Table 1. Mann-Whitney U test regarding the dimensions of Sport Engagement Scale (AEQ) according to athletes sex variables

Variable	Sex	Number of participants	Mean	Standard Deviation	Mean Rank	U	p-value
Confidence	Male	121	3.94	0.61	149.44	10701.00	0.141
	Female	196	4.05	0.55	164.90		
Dedication	Male	121	4.13	0.70	142.95	9916.50	0.013
	Female	196	4.33	0.57	168.91		
Vigour	Male	121	4.33	0.65	168.81	10670.50	0.130
	Female	196	4.23	0.65	152.94		
Enthusiasm	Male	121	4.14	0.63	148.65	10605.50	0.106
	Female	196	4.55	0.46	165.39		
AEQ	Male	121	4.20	0.52	151.22	10916.50	0.234
	Female	196	4.29	0.43	163.80		

Table 2 shows the athletes' perceived coaching effectiveness in the function of age groups. Statistically significant differences were observed across different age groups regarding athletes' perceptions of their coach's ability to motivate them ($H = 9.46$; $p = 0.009$). Dunn's post hoc test with Bonferroni adjustment (Q) was conducted to examine pairwise differences between age groups. The results indicated that volleyball players aged 12–14

reported statistically significantly higher scores for their coach's ability to motivate them compared to those aged 15–16 ($p = 0.047$) and 17–19 ($p = 0.018$). Significant differences were observed in the overall Coaching Efficacy Scale (CES) scores across different age groups ($H = 9.31$; $p = 0.009$). The 12- to 14-year-old age group scored statistically significantly higher on the perceived coaching effectiveness than the 17- to 19-year-old age group ($p = 0.010$).

Table 2. Kruskal-Wallis H test and Dunn's post-hoc analysis (Bonferroni Adjustment) for Coaching Efficacy Scale (CES) dimensions across athlete age groups

Variable	Age group (year)	Number of participants	Mean	Standard Deviation	Mean Rank	Kruskal-Wallis H	p -value	Dunn's test p -value
Motivation	1. 12 - 14	126	7.60	1.56	178.13	9.46	0.009	1 – 2 – 0.047
	2. 15 - 16	113	7.23	1.60	149.47			1 – 3 – 0.018
	3. 17 - 19	78	7.14	1.52	141.90			2 – 3 – 1.000
Game strategy	1. 12 - 14	126	7.96	1.17	172.15	4.79	0.091	—
	2. 15 - 16	113	7.79	1.14	154.04			
	3. 17 - 19	78	7.64	1.22	144.95			
Teaching Technique	1. 12 - 14	126	7.86	1.21	171.17	5.13	0.077	—
	2. 15 - 16	113	7.63	1.48	157.50			
	3. 17 - 19	78	7.41	1.45	141.52			
Character building	1. 12 - 14	126	8.02	1.16	172.18	5.79	0.055	—
	2. 15 - 16	113	7.78	1.33	156.73			
	3. 17 - 19	78	7.50	1.55	140.99			
CES	1. 12 - 14	126	7.86	1.18	176.99	9.31	0.009	1 – 2 – 0.137
	2. 15 - 16	113	7.61	1.24	153.29			1 – 3 – 0.010
	3. 17 - 19	78	7.42	1.24	138.21			2 – 3 – 0.792

Table 3 shows the sex-specific perceived coaching effectiveness of volleyball players. Mann Whitney U test was applied, and Statistically significant differences were identified in the measured variables of *Game Strategy* ($U = 9536.00$; $p = 0.003$), *Technique* ($U = 9689.00$; $p = 0.006$), and *Character Building* ($U = 9016.50$; $p < 0.001$),

with all the variables being scored higher by females compared to males. Notable variations in overall Coaching Efficacy Scale (CES) scores were also identified when analysing the results based on sex groups ($U = 9558.50$; $p = 0.004$): female volleyball players scored higher compared to males.

Table 3. Mann-Whitney U test regarding the dimensions of Perceived Coaching Effectiveness (CES) according to athletes' sex variables

Variable	Sex	Number of Participants	Mean	Standard Deviation	Mean-Rank	Mann-Whitney U	p -value
Motivation	Male	121	7.17	1.70	148.83	10627.50	0.120
	Female	196	7.47	1.48	162.28		
Game strategy	Male	121	7.60	1.19	139.81	9536.00	0.003
	Female	196	7.95	1.15	170.85		
Teaching Technique	Male	121	7.36	1.57	141.07	9689.00	0.006
	Female	166	7.86	1.21	170.07		
Character building	Male	121	7.42	1.60	135.52	9016.50	<0.001
	Female	196	8.05	1.08	173.50		
CES	Male	121	7.39	1.38	140.00	9558.50	0.004
	Female	196	7.83	1.09	170.73		

Table 4 shows the Spearman's correlations (ρ_s) between the CES and the AEQ variables. The variables of the CES are correlated with each other with a strong correlation ranging between 0.71 and 0.81 or a moderate

0.68 correlation. The correlations between the variables of the AES were also statistically significant, with moderate 0.56 and 0.61 or weak ranges between 0.30 and 0.47 correlations. The correlations between the over-

all CES and the overall AEQ variables were found to have a statistically significant positive weak correlation ($\rho_s = 0.35$). The individual variables of both scales demon-

strated a direct association with one another, exhibiting a significant but weak correlation (ρ_s ranging from 0.18 to 0.33).

Table 4. Descriptive statistics and Spearman's correlation coefficients (ρ_s) between Indicators of Athletes' Engagement (AEQ) and Perceived Coaching Effectiveness (CES)

Variables	M	SD	2	3	4	5	6	7	8	9	10
1 Motivation	7.36	1.57	0.75**	0.77**	0.71**	0.19**	0.18**	0.21**	0.25**	0.92**	0.26**
2 Game Strategy	7.82	1.17	1	0.81**	0.68**	0.25**	0.28**	0.21**	0.32**	0.89**	0.33**
3 Teaching Technique	7.67	1.38		1	0.74**	0.26**	0.29**	0.26**	0.35**	0.91**	0.38**
4 Character Building	7.81	1.34			1	0.26**	0.26**	0.26**	0.33**	0.84**	0.36**
5. Confidence	4.01	0.57				1	0.56**	0.30**	0.39**	0.25**	0.72**
6 Dedication	4.26	0.63					1	0.47**	0.56**	0.26**	0.83**
7. Vigour	4.27	0.65						1	0.61**	0.25**	0.76**
8. Enthusiasm	4.5	0.53							1	0.32**	0.79**
9. CES	7.66	1.23								1	0.35**
10. AEQ	4.26	0.47									1

Note: M = mean; SD = standard deviation; ** $p < 0.01$

Discussion

This study aimed to examine sex and age differences in young volleyball players' engagement in sports and perceived coaching effectiveness, as well as to explore the correlations between these variables. Athlete engagement is recognised as a key factor in preventing burnout symptoms among athletes; therefore, understanding the underlying mechanisms of engagement is crucial for enhancing competitive performance (Gu et al., 2023). According to Gjesdal et al. (2019), the coach's behaviour is less significant than how athletes perceive, interpret, and evaluate their coach's actions, as these perceptions are shaped by the subjective experience of a particular achievement context. Given that athletes' perceptions of coaching effectiveness can profoundly influence their sporting experiences in both team and individual sports, even across different cultural settings, the findings of this study hold relevance for fostering positive developmental and health-related experiences among young athletes.

Our study highlights high engagement scores of young volleyball players across all dimensions. High scores of athlete engagement were also found by Martins et al. (2014), Curran et al. (2015), and Jiang et al. (2023). High engagement scores demonstrate athletic sustainability and consistency in their athletic careers, as De Francisco et al. (2020) and DeFreese and Smith (2013) argue that engagement is the opposite of burnout. However, they are distinct constructs requiring individual attention.

The results of our study only partially supported the first hypothesis. We found that athletes aged 12–14 years scored significantly higher on the effectiveness of their coaches compared to athletes aged 15–16 and 17–19 years in *Motivation*. Also, athletes aged 12–14 years rated significantly higher on overall coaching effectiveness than athletes aged 17–19 years. The results of our study did not support younger athletes scoring considerably higher on engagement. No statistically significant differences were observed between age groups in any of the individual AEQ variables or the overall AEQ scale. This is at odds with the findings of other researchers. In a study conducted by Raimundi et al. (2024) on young Argentinian athletes (mean age = 15.92, $SD = 2.50$), significant differences were identified across all engagement dimensions (*Confidence*, *Vigour*, *Dedication*, and *Enthusiasm*) based on the interaction of gender, age, and competitive level. The findings of the study indicated that athletes aged 15 years or younger scored significantly higher across all engagement dimensions compared to those over 20 years old. Additionally, younger athletes exhibited higher levels of *Dedication* compared to those aged 16–19 years. However, Daraškevičiūtė and Poteliūnienė (2022), who investigated young swimmers' engagement in sporting activities, found that lower *Confidence* and *Enthusiasm* were characteristic of older swimmers (15–17 years) compared to younger swimmers.

The results of our study only partially supported the second hypothesis. It was found that females had significantly higher *Dedication* to the sport than males, and no

sex differences were found when calculating the overall engagement by combining all dimensions of engagement. The stronger *Dedication* of the young female volleyball players could be explained by the high popularity of volleyball among girls in Lithuania. In contrast, a higher proportion of male youth play the other two most popular sports in Lithuania – basketball and football. Research and practical experience suggest that the nature of volleyball is particularly appealing to girls, primarily due to its team-based structure, its positive impact on physical fitness, and its role in promoting a body image that aligns with societal norms. Since dedication reflects an athlete's commitment to put in the effort and time to achieve the goals they consider important, it may be related to the different quality of motivation between male and female young athletes, as researchers Jakobsen and Evjen (2018) have documented that females exhibited higher levels of intrinsic motivation for participating in sports compared to males. In contrast, males demonstrated greater reliance on extrinsic motivation. High-quality motivation is recognised as an essential prerequisite for engagement (Vallerand et al., 2008). Babić et al. (2015) studied Croatian sprinters and found no differences between males and females on individual dimensions of engagement. Additionally, Martins et al. (2015) conducted a study on young athletes and identified sex-based differences in their findings. Their results indicated that males exhibited higher levels of *Confidence*, while females demonstrated greater *Vigour*. Similarly, Raimundi et al. (2024) reported that male athletes displayed higher *Confidence* levels compared to their female counterparts. In addition, Verónica Alcaraz-Muñoz et al. (2023) argue that girls experience stronger positive and negative emotions than boys when engaging in physical activity and sports. It has been observed that girls exhibit more intense positive and negative emotions in competitive games compared to boys. In non-competitive sports activities, girls experience the highest level of positive emotional intensity, whereas boys' positive emotions are stronger in competitive games. Furthermore, when playing either competitive or non-competitive games, girls report more intense positive emotions in non-competitive settings, while boys show greater positive emotional intensity in competitive games.

An important insight regarding gender differences, Steinberg (2016) states that female adolescents express emotional relatedness to important figures compared to male adolescents. For example, Lisinskienė et al. (2022) state that during adolescence, the relationship between parents and young athletes weakens, while the coach's authority increases. In this sense, our study results show that female athletes express a higher score on coach effectiveness and engagement in sports in the sports context, where the coach remains the most important figure, female adolescent athletes express a greater authority and relatedness, and attachment to the coach.

The findings of the study did not indicate that male athletes perceive coaching effectiveness more favourably than female athletes. Female athletes rated overall coaching effectiveness and motivation significantly higher than male athletes. Mohd Kassim et al. (2020) studied team sport athletes and found no significant differences between male and female groups across all individual dimensions of coaching effectiveness, including *Motivation*, *Technique*, *Game Strategy*, and *Character Building*.

The findings of this study align with the third hypothesis, indicating that athletes who perceive their coach as more effective tend to demonstrate higher levels of sports engagement. Although statistically significant correlations were observed between CES and AEQ variables, these associations were weak, suggesting that the individual components of both scales are directly related, albeit with low correlation strength. This implies that athletes' engagement may be influenced by their perceptions of coaching effectiveness. Previous research has shown that perceived coaching effectiveness is related to a range of variables of an athlete's personal development and coach-athlete interactions (Mohd Kassim and Boardley, 2018). Athletes' perceptions of coaching effectiveness are linked to satisfaction with their coach (Boardley et al., 2015), which may affect their engagement and long-term sporting career. Research conducted with young athletes demonstrates that engagement is positively associated with high-performance experiences (Raimundi et al., 2024), the satisfaction of basic psychological needs, and experiencing less psychological distress (Kamimura et al., 2018). Kamimura et al. (2018) found that athletes who experienced less stress in interpersonal relationships had a lower risk for engagement variables such as weaker vigor and enthusiasm. Thus, to better explain the links between perceived coaching effectiveness and athlete engagement, there is a need to explore how these relationships are mediated by personal variables (e.g. motivation, satisfaction with the coach) and educational environment variables (e.g. the motivational climate created by the coach). However, further research is required to substantiate this assumption. Furthermore, our study identified significant inter-dimensional associations within AEQ, consistent with the findings of Jiang et al. (2023), Martins et al. (2014), Mohd Kassim et al. (2020), and Raimundi et al. (2024). However, in contrast, Babic et al. (2015) did not find statistically significant associations between these variables in either the male or female sample. To optimise the coaching process, it is essential to understand how coaches perceive their efficacy and how athletes perceive coaching effectiveness. Coaches' behaviour directly influences athletes' perceptions of their coaches' actions, and these perceptions, in turn, shape athletes' self-perceptions, beliefs, and attitudes, ultimately impacting their motivation and performance.

(Côté & Gilbert, 2009). Beyond fostering physical development and enhancing sport-specific skills, coaching also plays a crucial role in shaping athletes' psychological well-being. Given that coaching is a dynamic social interaction where both parties influence one another (Jowett, 2017), research that explores coach-athlete performance appraisals may offer valuable educational insights.

The current study performed a coach-athlete research analysis within the sport of volleyball, highlighting the importance of coach-athlete interaction. However, this study possesses several drawbacks. First, although the study's sample size was large enough, it used non-probability sampling. Our sampling method was deliberate, covering young volleyball players from different regions of Lithuania and large and small cities. Nevertheless, convenience sampling is inherently biased, and the results cannot be generalized to the entire population of young volleyball players. Second, we conducted a cross-sectional study, which limits our ability to establish a causal relationship between athletes' engagement and perceived coach effectiveness. Thus, it is appropriate to identify cause-effect relationships through longitudinal studies and a mixed-method approach. Furthermore, the relationships between the variables analysed may likely be mediated through mediators, and it would be appropriate to extend the study by introducing and adding additional variables. Kavussanu et al. (2008) assert that athletes' opinions of coach efficacy may be affected by their traits, gender, and sports experience. Thus, these variables are important in coaching effectiveness research. Further research should include more variables and analyse coaches' beliefs about their coaching efficacy. Research conducted by Chao et al. (2023) and Teatro et al. (2017) indicates that coaches' beliefs about their coaching efficacy are significantly higher than the coaching effectiveness perceived by athletes. Conducting a qualitative study on perceptions of coaching effectiveness would also be helpful. This is likely to reveal the key variables important for understanding athletes' expectations and increasing their confidence in their coach.

An additional bias may also occur because we relied on the athletes' self-reported information about their engagement, and the athletes may have over- or under-reported their engagement in sport. Although questionnaires are widely used in sports to investigate educational and psychological phenomena, the results should always be interpreted cautiously. However, further quantitative and qualitative data collection research is needed to gain further insights into the phenomenon under investigation.

Conclusion

This study highlighted the fact that, despite the proven benefits of sport, young athletes may be exposed to

negative and unfavourable consequences, which may influence their early retirement from sport. The coach plays a crucial role in shaping the experience of young athletes, and researchers are increasingly focused on understanding how coaches' behaviour influences a positive youth sports experience, with the aim of encouraging adolescents to sustain their participation in sports into adulthood. The relationship between young volleyball players' engagement and perceived effectiveness of their coaches was examined, and positive associations between these components were found. Differences in the indices of young athletes' engagement and perceived coaching effectiveness were also revealed based on age and sex variables. Thus, the results of the study are helpful for coaching practice. The findings of higher scores for adolescent females than for males in the assessment of coaching effectiveness suggest that volleyball coaches need to reflect more on their performance, especially when working with adolescent males, to understand the athletes' expectations. The significantly lower scores observed for coach motivational effectiveness as the age of the athlete increases should encourage coaches to critically reflect on their strategies and how they are meeting the needs of adolescents of different ages. The findings of the study on perceived coaching effectiveness can assist coaches in gaining a deeper understanding of athletes' expectations, enhancing their coaching practices, and fostering a stronger coach-athlete relationship through increased mutual feedback. This, in turn, is expected to boost athletes' engagement in sports activities.

Ethics Approval and Informed Consent

The research was carried out following the provisions underlining the basic principles of professionalism and research ethics approved by Resolution No SEN-N-17.

Competing Interests

No competing interests.

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