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ORIGINAL RESEARCH

How does coach encouragement affect soccer test performance?

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Abstract

This study investigated the effects of positive and negative coach encouragement (CE) on young soccer players' physical test performance and technical abilities. A single-blind, time-parallel experimental research model was developed. Nineteen young soccer players (age = 16.95 ± 0.78 years) voluntarily participated in the study. This study was conducted in two stages. In the first part, soccer players were subjected to different tests to determine their speed, agility, jumping, balance, and aerobic fitness level without any encouragement from the coach. These tests were performed with the CE in the second part. According to the study findings, positive CE was more effective than negative CE on the aerobic fitness level, sprint, jump, and zig-zag without ball test performances ($p<0.05$). The results of this study emphasize the significance of verbal CE in enhancing the physical and technical capabilities of young soccer players. By providing positive and motivating feedback, coaches can positively impact players' performance and contribute to their overall development and success in sports.

Keywords: Coach, feedback, performance, positive feedback, verbal encouragement.

Introduction

Soccer demands various capabilities for success, including athletic ability, physiological characteristics, mental capacity, and understanding of the game's nature (Arslan et al., 2022; Soylu, 2021; Soylu & Arslan, 2021). The characteristics of players and the factors affecting the development of young soccer players have been the subject of many studies (Stølen et al., 2005; Vaeyens et al., 2008). However, soccer-specific training methods can control mental and physical demands as well as fatigue (Thompson et al., 2020). However, athletes' perceptions of exercise difficulty eliminate their ability to maintain performance through physical demands (Marcora, 2008). Coaches' feedback improves performance and alters the training environment.

Coaching behaviour is a soccer strategy that can facilitate athlete-environment interactions within ecological dynamics (Woods et al., 2020). Manipulating coaches' behaviors during training purposefully and deliberately influences training development (Brandes & Elvers, 2017). Therefore, soccer coaches act as a specific soccer training strategy (Díaz-García et al., 2021). The coaches' analysis and intervention system was developed to evaluate coaches' behaviors, interventions, and strategies, especially their verbal feedback (Cushion et al., 2012). Díaz-García et al. (2021) stated that this tool includes positive feedback statements, including verbal and non-verbal behaviors, to improve performance and praise for training satisfaction. Recent research has also found that coaches at all levels use verbal instruction as their primary activity (Sahli et al., 2020, 2022b).

Coach feedback, often known as encouragement or courage, is the use of language to inspire or motivate a person to face a challenging situation or fulfill a potential (Wong, 2015). These practices are a source of internal motivation to achieve optimal physical performance, and coaches use phrases such as "Well done, you are using good strategies," "You will succeed," "I am proud of you," and "You can do it" as encouragement or feedback (Sahli et al., 2022b).

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Nevertheless, how a coach verbally interacts with athletes can significantly affect how well they improve as performers and learn new skills (Correia et al., 2019; Partington et al., 2014). As a result, the encouragement or feedback applied by the coach to the player during the performance may cause behavioral changes in the athlete.

Encouraging expressions, which are used in many different areas along with sports, is effective in creating measurable effects on emotional reactions and cognition (Martín-Loeches et al., 2009; Sahli et al., 2023). Studies have examined the effect of coach encouragement (CE) in small-sided games on soccer performance (Sahli et al., 2020), the change in direction sprint test (Sahli et al., 2022b), the effect of coaches' and players' sources of social influence on increasing players' intention to intervene with teammates after a game-specific error (Sahli et al., 2023), and mental and physical load (Díaz-García et al., 2021). A literature review revealed a gap in examining the effect of CE on performance tests, such as speed, agility, jumping, technical skills, and balance, in young soccer players. Therefore, we hypothesized that coach encouragement, which has been shown to have a positive effect on soccer players in various applications, also has a positive effect on test performance responses. This study investigates the effects of positive and negative CE on physical performance.

Methods

Participants

This study used a single-blind group and time-parallel experimental design. Nineteen young male amateur soccer players (age = 16.95 ± 0.78; height = 173.32 ± 7.26; weight = 63.08 ± 8.00; body mass index = 20.92 ± 1.52) participated in the study. The participants were instructed to stay away from exercise for two days, refrain from eating for at least three hours before the test, and put all of them into each repetition. The study protocol complied with the ethical human testing guidelines outlined in the Declaration of Helsinki and its modifications. This study was approved by the Research Ethics Committee (26428519/100) and conducted in accordance with the Declaration of Helsinki.

Procedure

This research was conducted during the middle of the 2022-2023 soccer season. Anthropometric characteristics were assessed using the YO-YO Intermittent Recovery Test Level 1 (YYIRTL-1). Two sessions of performance tests directed at active observation were performed on separate days one week apart. The test protocols consisted of both positive and negative CE tests. During each experimental session, participants were performed positive CE tests in the first day and second day they performed tests with negative CE in a randomized order. To minimize the adverse effects of fatigue on physiological and technical responses, each CE intervention was performed by at least 2 days interval.

Regarding communication strategies, Smith et al. (1977) classified coaches' verbal behavior into reactive (player action-verbal response) and spontaneous behavior (not related to the player's concrete action). Spontaneous behaviors include (1) general technical instructions or technical corrections (e.g., correction of technical execution); (2) general positive encouragement, including advice but not corrections (e.g., come on!, good job!); and (3) organizational aspects (e.g., distribution of players or training rules). A new tool for assessing coaches' behavior is the Coaches' Analysis and Intervention System (CAIS) (Cushion et al., 2012), which includes information about coaches' verbal behavior. This tool includes, among other dimensions, praise (e.g., "your work rate was excellent today" and other supportive verbal or nonverbal behaviors expressing the coach's general satisfaction but not specifically aimed at improving the player's performance), generally positive feedback (e.g., "good try," "well done"), and hustle (e.g., verbal statements aimed at intensifying athletes' efforts).

In the positive CE group, coach feedback during the game included statements such as "Go, well done, everything is fine, this is great, don't give up, great, courage, keep going, very good, excellent movement, come on, very good pass, very good tackle, I'm proud of you." In the negative CE group, encouraging statements such as, you need to struggle a little bit, you need to try harder to succeed, this is not enough, you need to work harder if you want to succeed, and you are not struggling enough. These encouraging statements are often used in sports performance or physical education policies. The same researchers were present during the performance tests, and participants were given the same level of encouragement. During the study, all the participants were instructed to maintain their usual physical activities. All measurements were performed in the same synthetic turf field at the same time of the day

(between 9:00 am and 10:30 am) to limit the effects of circadian variations on the measured variables. Participants were also asked to follow their normal diet throughout the study.

Measurements

Aerobic Test: The YO-YO Intermittent Recovery Test Level 1 (YO-YO IRT1) measures an athlete's ability to perform repeated intense exercises with intermittent recovery periods. It is commonly used to assess an individual's aerobic capacity and ability to tolerate high-intensity intermittent activities. The test involved running between two markers that were placed 20 m apart. Participants had to complete shuttle runs within 10 seconds of brief periods of active recovery in jogging or walking between each shuttle run. The shuttle speed increases as the test progresses, making it increasingly challenging. It measures an individual's maximal oxygen uptake (VO2 max), which reflects their aerobic capacity and overall fitness level. The test protocol typically involves a standardized warm-up followed by progressive shuttle runs until exhaustion. The distance covered, or the level achieved before exhaustion, is a performance measure. The test was performed on a natural grass pitch according to the procedures suggested by Bangsbo et al. (2008).

Sprint tests: The Sprint test is a fitness assessment that measures an individual's speed and acceleration over a short distance. The participants began the test standing with one foot slightly behind the starting line. The feet should be shoulder-width apart and the body should lean slightly forward. A signal such as a whistle or verbal command initiates the sprint. Each player stood ~70 cm behind the start line and then performed a 20 m sprinting test (with 5–10 and 20 m splits). For this test, the player performed three trials separated by 2 min of passive resting. The test times were measured using a Witty SEM system (Microgate, Bolzano, Italy).

Countermovement jump test: The Countermovement Jump (CMJarm) jump heights were measured for each player using Optojump photoelectric cells (Microgate, Bolzano, Italy). A countermovement jump (CMJ) was performed with the hands placed on the hips to minimize the involvement of the upper limbs. However, for CMJarm, players can jump with a free arm swing (Slinde et al., 2008). To ensure proper recovery and minimize fatigue, the players had 2 minutes of passive rest between consecutive trials within the same jumping test. Additionally, there was a 5-minute rest period between the different jumping tests.

Standing broad jump test: standing road Jump (SBJ). The participants stood behind the starting line with their feet shoulder-width apart, thereby encouraging a balanced stance. The participants stood tall with a weight evenly distributed on both feet. The participants performed a two-footed take off, pushing off explosively with both feet, simultaneously. They swing their arms forward and upward to generate upward momentum and assist jumping. Participants landed on both feet simultaneously. SBJ distance was measured as the distance from the starting line to the heel closest to the starting line on the landing point. SBJ was performed starting with a static semi-squatting position maintained for a second without any preliminary movement. The participants rested passively between each jumping test for two minutes and five minutes between each leaping test.

Agility tests (with and without the ball): The participants completed three zigzag agility tests on a synthetic grass field, both with and without the ball. Each set was followed by a recovery period of 3 min. The fastest time recorded from all the sets was considered to be the performance of the zigzag agility tests with and without the ball. The zigzag agility course consisted of four 5-meter sections arranged at 100° angles. A previous study by Mirkow et al. (2008) reported a coefficient of variation of 21.12%, intraclass correlation coefficients of 0.81 and 0.84, and typical errors of measurement of 0.21 and 0.098 for the zigzag agility tests with (ZAWB) and without the ball (ZAWOB), respectively. The zigzag test was chosen because of its ability to assess acceleration, deceleration, and balance control, which are the essential aspects of agility. Additionally, the participant's familiarity with the test and its relative simplicity minimized the potential for learning effects (Little & Williams, 2005). There were no specific rules regarding the number of ball touches during the zigzag agility test. The time measurements were performed using a Witty SEM system (Microgate, Bolzano, Italy).

Statistical Analysis

Data analysis was performed using the statistical software IBM SPSS Statistics, version 26 (IBM Corporation, Armonk, NY, USA). Means and standard deviations (SD) were used to present the measurement results. The normality of the data was assessed using the Kolmogorov-Smirnov test, which indicated a normal distribution. A paired-sample t-test was used to determine the differences in physical performance test variables between tests performed with and without CE.

The effect sizes (Cohen's d) were computed for each dependent variable following established thresholds:0.2 = trivial effect, 0.6 = small effect, 1.2 = moderate effect, 2.0 = large effect, and > 2.0 = very large effect (Hopkins et al., 2009).

Results

Table 1 summarizes the results of the comparison between the physical performance responses of the CE session and the session without CE.

Table 1 shows the physical performance test responses of young soccer players with and without CE. The CE+PT condition induced significantly higher performance test responses in YYIRTL-1 ($p < 0.000$; $d = 0.48$ ([small effect]), VO_{2max} ($p < 0.000$; $d = 0.48$ [small effect]), CMJ ($p < 0.001$; $d = 0.31$ [small effect]), SBJ ($p < 0.025$; $d = 0.66$ [moderate effect]), 5-m sprint ($p < 0.045$; $d = -0.74$ [moderate effect]), 10-m sprint ($p < 0.000$; $d = -1.06$ [moderate effect]), 20-m sprint ($p < 0.003$; d = 0.45 [small effect]), and ZAWOB ($p < 0.000$; $d = -0.58$ [small effect]) than the woCE+PT condition.

The ZAWB score was significantly higher ($p < 0.001$; $d = -0.77$ [moderate effect]) in the CE + PT group than in the woCE+PT group (Figure 1).

Table 1
Performance test responses of young soccer players with and without CE.

	CE + PT	woCE + PT	Mean Difference	%95CI Lower - Upper	*d*	*p*
YYIRTL-1 (m)	1497.89 ± 358.51*	1332.63 ± 335.74	165.26	-225.28 to -105.25	0.48	0.000
VO_{2max} (ml·min^{-1}·kg^{-1})	48.99 ± 3.01*	47.59 ± 2.81	1.40	-1.90 to - 0.89	0.48	0.000
CMJ (cm)	44.29 ± 5.43*	42.66 ± 4.95	1.63	-2.45 to -0.80	0.31	0.001
SBJ (cm)	221.95 ± 22.62*	208.95 ± 16.60	13.0	-24.17 to -1.83	0.66	0.025
5-m sprint (s)	0.90 ± 0.06*	1.02 ± 0.23	0.12	0.00 to 0.23	-0.74	0.045
10-m sprint (s)	1.67 ± 0.09*	1.76 ± 0.12	-0.09	0.05 to 0.13	-1.06	0.000
20-m sprint (s)	3.03 ± 0.14*	2.96 ± 0.17	0.07	-.12 to -.0.02	0.45	0.000
ZAWOB (s)	5.20 ± 0.19*	5.31 ± 0.19	-0.11	0.16 to 0.15	-0.58	0.000

*Data are Mean ± SD. CE+PT: Performance tests with coach encouragement; woCE+PT: Performance tests without coach encouragement; CMJ: Countermovement jump; SBJ: Standing broad jump; ZAWOB: zigzag agility without ball; CV: coefficient of variation; %95CI: 95% confidence interval (95% CI was estimated for the difference between two means; ES: effect size (absolute value); *Significant difference p≤0.05.*

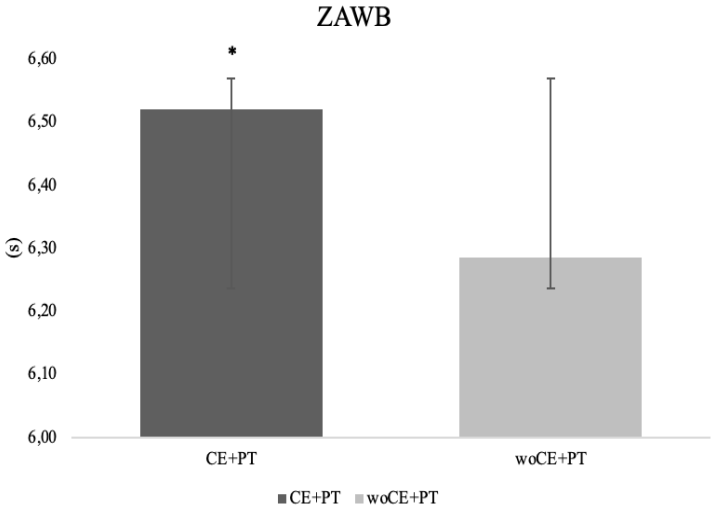

Figure 1. Technical ability test.

Discussion

This study investigated the effects of positive and negative CE on the physical performance and technical abilities of young soccer players. CE significantly increased the YO-YO Intermittent Test level 1 (YYIRTL-1), maximal oxygen uptake (VO_{2max}), countermovement jump test (CMJ), and standing broad jump (SBJ). CE also significantly decreased the 5-10-20m-sprint and Zig zag agility tests without the ball (ZAWOB). Furthermore, technical ability improved after CE in the ZAWB test.

The content and frequency of a coach's verbal feedback during exercise performance are the key factors that determine the effectiveness of encouragement. Studies using positive encouragement have been commonly reported in the literature (Kilit et al., 2019; Rampinini et al., 2007; Sahli et al., 2022a; Sahli et al., 2022b; Selmi, 2017). Andreacci et al. (2002) investigated the impact of verbal encouragement provided at 20-, 60-, or 180-second intervals during maximal cardiopulmonary endurance exercise on a treadmill. The findings showed that verbal encouragement (VE) provided every 20 or 60 s resulted in significantly higher values of VO_{2max}, exercise duration, blood lactate concentration, respiratory exchange ratio, and perceived exertion levels than no VE or encouragement provided every 180 s. Similarly, Midgley et al. (2018) found that VE provided every 20 seconds during the Wingate test resulted in a longer time to exhaustion during the VO_{2max} test than encouragement provided every 60 or 180 seconds. In contrast, the coach's active and passive effects did not affect external loads, but they increased internal loads, such as the rating of perceived exertion (RPE), mental effort and performance satisfaction in professional soccer players (Díaz-García et al., 2021).

In the present study, athletes who received positive VE from their coaches performed better in sprint test performance 5-m, 10-m, and 20-m than athletes who received negative encouragement. This is consistent with a study on recreationally active individuals by Edwards et al. (2018), which showed VE to improve cycling sprint performance (2 × 30 s Wingate test) in active adults. However, this effect does not seem to translate into improved 30-m female soccer players (Hammami et al., 2023). Therefore, the results of the present study show that VE can have a different effect on athletes or individuals depending on their personality, past experiences, task specificity, and motivational factors. In contrast, Pacholek & Zemková (2022) found that different combinations of encouragement changed the performance test scores of young adults. External stimuli, such as VE and goal setting, can significantly improve performance on fitness tests. This effect was observed across all fitness tests, except for the 10-m and 30-m sprint tests, where VE alone did not result in statistically significant performance changes.

The findings of this study demonstrate that the positive encouragement provided by coaches contributes to an increase in power outcomes and enhances performance in CMJ and SBJ. The findings of a study conducted by Hammami et al. (2023) on the impact of CE on CMJ and five jump performances in female soccer players support this study. Similarly, Vasconcelos et al. (2020) found that VE and a competitive motivational stimulus significantly improved futsal performance. Pacholek & Zemková's (2022) vertical jump test showed the most significant statistical differences when external stimuli were applied compared to when no stimuli were present. The inclusion of VE and a combination of stimuli resulted in greater improvements than those without stimuli. In addition, the combined effect of goal-oriented stimuli and VE was more effective than VE alone. Similarly, VE caused significant changes in force production (Belkhiria et al., 2018; Lee et al., 2021). Overall, these findings highlight the significant influence of positive CE on improving power outcomes, jump performance, and force production.

The results of the zigzag test in this study, both with and without the ball, demonstrate that a positive CE can significantly impact both agility and technical skill. A study utilizing CE found that young basketball players showed an improvement in the direction of running performance (Hammami et al., 2021). Additionally, CE increased agility among female soccer students (Hammami et al., 2023). Positive coaching encouragement significantly improved performance on the zigzag test, which measures technical skill using the ball version in the present study. Hammami et al. (2023) confirmed the findings of this study by reporting that CE is a useful method in the teaching-learning process during soccer-specific games from school-based exercises. Additionally, combined coach encouragement (CE) during small-sided games is associated with improved skills (Sahli et al., 2022b; Selmi et al., 2023).

The limitations of this study should be considered when evaluating the findings. The sample size was relatively small, which may limit the generalizability of the results. A larger and more diverse sample size would better represent the population. In addition, this study focused on young male soccer players, which could limit the applicability of the results to professional or elite players. Finally, the specific age, sex, and skill level of the participants could have affected the generalizability of the findings.

Conclusion

In conclusion, this study investigated the impact of positive and negative CE on physical performance tests and technical abilities of young soccer players. These findings demonstrate that CE plays a significant role in enhancing several aspects of player performance. Specifically, the findings of this study contribute to our understanding of the role of CE in optimizing the physical and technical performance of young soccer players. By recognizing and utilizing the power of positive verbal feedback, coaches can create supportive and motivational environments that empower players to reach their full potential in the field.

Authors' Contribution

Study Design: YS, OY; Data Collection: YS, OY; Statistical Analysis: EA, YS; Manuscript Preparation: BK, YS; Funds Collection: BK, EA.

Ethical Approval

The study was approved by the Tokat Gaziosmanpasa University of Social and Humanities Research Ethical Committee (2023/09.11), and it was carried out by the Code of Ethics of the World Medical Association, also known as the Declaration of Helsinki.

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Conflict of interest

The authors hereby declare that there was no conflict of interest in conducting this study.

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