

RESEARCH ARTICLE

Effect of coach encouragement on game performance in young female volleyball players

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Abstract

Aim: This study examined the impact of coach encouragement (CE) on the technical performance and psychophysiological responses of adolescent female volleyball players in competitive game. **Method:** Twenty-four young female amateur volleyball players (age = 16.00 ± 0.98 years) participated voluntarily. Participants played 4v4 SSG (wCE and woCE). Sets are conducted over a period of 20 minutes, consisting of one set. Heart rate, psychophysiological and technical responses were recorded during the games. A standard volleyball warm-up was performed before the games. Paired t-tests were used for normal distribution. **Results:** Significant differences were found in successful forehand pass, unsuccessful forehand pass, successful overhead pass, successful other pass, unsuccessful other pass and successful total pass ($p < 0.05$). No significant differences were found in maximum/average heart rate (HR), enjoyment, mental effort, successful/unsuccessful dunk pass, unsuccessful overhead pass, and unsuccessful total pass ($p > 0.05$). Significant differences were found in successful and unsuccessful forehand pass in favor of play without coach encouragement. Significant differences were found in successful overhead pass, successful/unsuccessful other passes and successful total pass in CE game encouragement. **Conclusion:** While CE does not make a difference in physiological and psychological aspects, it has been observed that it has a generally positive effect, although there are different results in terms of technical performance.

Keywords: Coach encouragement, game performance, technical performance, volleyball.

Introduction

Volleyball is a highly dynamic sport defined by numerous sprints, hops (both blocking and spiking), and intense court motions that are executed regularly throughout competition (Silva et al., 2019; Keoliya et al., 2024). Volleyball performance depends not only on technical skill and physical capability but also on personality characteristics, particularly focused attention (Al-Rubaie, 2024). High concentration enables players to precisely control movements, quickly interpret game situations and make the right decisions under pressure (Martins et al., 2022). Consequently, the CE method has been lately employed to optimize performance during training and competitions (Hidayat et al., 2025).

The systematic manipulation of coaches' behavior during training influences the athletic development of athletes (Brandes & Elvers 2017). Hammami et al. (2023) indicated that general technical guidelines and positive verbal encouragement as communication tactics can influence players' physical abilities and emotional states. Therefore, verbal encouragement from the coach is used as an external motivator to increase physical participation and desire to train. Wong (2015) characterized verbal encouragement as the act of providing courage, dedication, confidence, motivation and optimism for overcoming challenging circumstances or realize potential.

In volleyball, the effect of CE has been examined in sports such as, soccer (Hammami et al., 2023; Soyly et al., 2024), handball (Sahli F. et al., 2023), basketball (Sánchez-

Sánchez et al., 2018; Yilmaz et al., 2025; Hammami et al., 2021), and tennis (Kilit et al., 2019; Kilit et al., 2024). Hidayat et al. (2025) investigated the impact of CE on physical performance (agility, speed, endurance, explosive strength) and game performance (serve, pass, attack, and defense) in volleyball. Further research is required to support these findings in volleyball contexts. This study proposes to investigate the impact of CE on the performance of young volleyball players in matches.

Method

Participants

Twenty-four young female amateur volleyball players (age = 16.00 ± 0.98 years; height = 161.58 ± 5.66 cm; weight: 55.74 ± 10.92 kg) participated voluntarily. All players had a minimum of 2 years of competitive volleyball experience and perform an average of 5 – 6 training sessions per week, each lasting 80–110 minutes.

Procedure

The study employed a repeated-measures approach in which participants played a series of SSG under two conditions: with coach encouragement (wCE) and without coach encouragement (woCE). Before starting gameplay, participants performed anthropometric assessments (height and body weight) and completed the Yo-Yo Intermittent Recovery Test (Yo-Yo IRT-1) to evaluate fitness levels and effectively allocate players into equal teams (Bangsbo ve ark., 2007). The games were played at

different times, one week apart. First, the game was played with wCE game, then later woCE game played.

The game format is 4 v 4 wCE and woCE. Sets are played in a duration of 20 minutes, comprising a single set. No rest interval exists between sets. The dimensions of the playing field are 12 x 4.5 meters. Throughout the research, psychophysiological responses were consistently monitored, encompassing HR_{max} (beats·min⁻¹), enjoyment, mental effort, and technical performance. Technical actions were recorded and assessed via video-based performance analysis to evaluate execution under different scenarios (with CE vs. without CE). CE incorporated positive comments, encouragement of effort, and technical feedback. Previous research (Smith et al., 1977) indicates that coaches employ particular communication tactics through verbal behavior in wCE games. During the wCE periods, the coach delivered organized CE during the games. The verbal encouragement included three main types: (1) positive reinforcement (e.g., "Excellent job!" or "Keep going!"), (2) effort reinforcement (e.g., "Keep focused!" or "Exert greater effort!"), and (3) technical feedback (e.g., "Search suitable teammates!" "Adjust your position!") (Cushion et al., 2012).

Psychophysiological Measurements

During the games, players' heart rate measurements were recorded using a Polar H10 band (Polar Electro Oy, FI-90440 Kempele, Finland), capable of capturing heart rate at one-second intervals and measuring pulse from the chest. The 8-item Exercise Enjoyment Scale, created by Raedeke (2007), was utilized to assess player enjoyment. The research employed the Turkish-adapted version verified by Soylu et al. (2023), which revealed strong psychometric characteristics in adolescents and adult athletes. Players assessed their happiness on a 1 to 7 Likert scale. Total scores range from 8 to 56 (lowest enjoyment/most enjoyment). The mental effort scale was used to assess perceived cognitive effort at specific points during performance (Zijlstra, 1993). The Mental Effort scale requires participants to rate the amount of mental effort required to complete a task, ranging from 0 (Absolutely no effort) to 150 (Extreme Effort). After each game,

participants marked the range on the Mental Effort scale indicating the effort they had expended. The scales were filled out immediately after the games.

Technical analysis

Two high-resolution video cameras (Canon LEGRIA HF R806, Japan) were used to capture the games and analyze the technological movements. The games were evaluated using a volleyball-specific analytical tool called e-analysis volleyball, created by Espor Dijital Ltd. in Ankara. In technical analysis, forehand pass, overhead pass, dunk pass, other pass, total pass were analyzed. Other pass includes all shots that allow the game to continue, except for forehand pass, dunk pass, overhand pass, which are among the three passes that fall under the rule. The technical analysis was coded and performed by an experienced volleyball analysis coach.

Data Analyses

Mean $\pm$ standard deviation (SD), 95% confidence interval (CI) of differences, and effect sizes (ES) are the formats in which the data are provided. Skewness, Kurtosis, and Shapiro-Wilk tests were employed to assess normal distribution. Paired t-tests were employed for normally distributed data. Effect sizes (Cohen's d) were computed for each dependent variable, categorized as trivial (<0.2), small (0.2–0.6), moderate (0.6–1.2), large (1.2–2.0), and very large (2.0–4.0) (Hopkins et al., 2009). Statistical analyses were conducted utilizing SPSS software version 26.0 for Windows (SPSS Inc., Chicago, IL, USA).

Results

Significant differences were found in successful forehand pass, unsuccessful forehand pass, successful overhead pass, successful other pass, unsuccessful other pass and successful total pass ($p < 0.05$). No significant differences were found in maximum/average heart rate (HR), enjoyment, mental effort, successful/unsuccessful dunk pass, unsuccessful overhead pass, and unsuccessful total pass ($p > 0.05$) (Table 1).

Table 1. HR, mental effort, enjoyment and technical results of young volleyball players in games wCE and woCE.

Variables	wCE Game Mean $\pm$ SD	woCE Game Mean $\pm$ SD	Mean Difference	%95 CI	<i>p</i>	<i>d</i>	Descriptor
HR _{max}	179.92 $\pm$ 16.13	180.96 $\pm$ 13.90	-1.04	-5.31 – 3.23	0.619	-	-
HR _(beat·min⁻¹)	160.21 $\pm$ 18.40	162.96 $\pm$ 17.53	-2.75	-7.59 – 2.09	0.253	-	-
Enjoyment	31.83 $\pm$ 4.16	33.50 $\pm$ 4.57	-1.67	-4.33 – 1.00	0.209	-	-
Mental Effort	92.92 $\pm$ 33.42	78.54 $\pm$ 36.40	14.38	-6.98 – 35.73	0.177	-	-
Successful Forehand Pass	32.67 $\pm$ 4.64	40.21 $\pm$ 5.54	-7.54	-9.45 – -5.62	0.001*	-1.66	Large
Unsuccessful Forehand Pass	2.25 $\pm$ 0.73	3.50 $\pm$ 0.83	-1.25	-1.43 – -1.06	0.001*	-2.82	Very Large
Successful Dunk Pass	9.21 $\pm$ 2.18	8.88 $\pm$ 2.29	0.33	-0.44 – 1.10	0.382	-	-
Unsuccessful Dunk Pass	6.21 $\pm$ 1.47	6.08 $\pm$ 2.06	0.13	-0.34 – 0.59	0.588	-	-
Successful Overhand Pass	37.50 $\pm$ 3.32	29.00 $\pm$ 6.22	8.50	5.89 – 11.10	0.001*	1.37	Large
Unsuccessful Overhand Pass	1.21 $\pm$ 0.65	1.33 $\pm$ 0.48	-0.12	-0.41 – 0.16	0.377	-	-
Successful Other Pass	10.67 $\pm$ 3.76	6.79 $\pm$ 2.39	3.88	3.07 – 4.67	0.001*	2.04	Very Large
Unsuccessful Other Pass	4.83 $\pm$ 2.16	3.71 $\pm$ 1.80	1.12	0.52 – 1.72	0.001*	0.79	-
Successful Total Pass	90.08 $\pm$ 6.86	84.88 $\pm$ 5.37	5.20	4.26 – 6.15	0.001*	2.31	Very Large
Unsuccessful Total Pass	14.50 $\pm$ 3.95	14.63 $\pm$ 3.94	0.13	-0.72 – 0.47	0.671	-	-

HR: Heart Rate, Max: Maximum, * Significant Difference, * $p < 0.05$

Discussions

This research examined the impact of coach encouragement (CE) on psychophysiological and technical performance of young volleyball players. A significant difference was observed in the results of successful forehand pass, unsuccessful forehand pass, successful overhead pass, successful other pass, unsuccessful other pass, and successful total pass. No significant differences were found in HRmax, HRavg, enjoyment, mental effort, successful/unsuccessful dunk pass, unsuccessful overhead pass, and unsuccessful total pass.

Verbal encouragement from the coach appears to improve overall passing performance, but the effect of encouragement on specific skills such as the dunk pass is limited. The dunk pass technique requires faster reflexes and focus than other passes. Despite the favorable external courage from the sidelines, this may have created stress in the players. Increased stress may have disrupted athletes' focus, increasing the likelihood of making errors in automated movements such as the dunk pass. Increased self-attention during performance can lead to a decrease in performance by causing conscious control of automatic motor programs (Beilock & Carr, 2001). For these reasons, coach-incentive play may have negatively affected successful forehand passes. A similar study results show that, CE increased volleyball players' physical performance (agility, speed, endurance, explosive strength) and game performance (serve, pass, attack, defense) (Hidayat et al., 2025). Other studies in team sports have demonstrated that CE enhance motor performance, speed, explosive strength, agility and endurance in football players (Hammami et al., 2023), as well as passing technical skills and mood in handball players (Sahli et al., 2022), and passing, shooting and dribbling technical skills in basketball players (Rusmana et al., 2023), passing and shooting technical skills (Yılmaz et al., 2025).

HRmax, HRavg, enjoyment, and mental effort results did not show significant differences. Research on the effects of coaching encouragement on HR and psychophysiological responses in volleyball players is quite limited in the literature. Changes in attention and cognitive control mechanisms caused by coaching encouragement may affect technical performance, but may not directly affect peripheral responses such as heart rate (Eysenck & Calvo, 1992). Herlambang et al. (2021) stated that high intrinsic motivation, rather than extrinsic motivation, may increase performance in cognitive tasks such as mental effort. This is why extrinsic motivational sources such as coaching may not have made a difference in mental effort.

The results of these products must be assessed considering several limitations. The participants were young amateur volleyball players with experience. Consequently, the findings may not be applicable to persons of varying ages, skill levels, or competition types. Sample size and specificity (young female amateurs), potential for order effects, lack of qualitative data on athletes' perceptions of CE, and the multiple comparisons issue. This study utilized primarily psychophysiological and technical reactions to WCE and WCE games. The results

may not entirely represent the outcome and kinematic movements.

Practical Applications

This study demonstrated that wCE play significantly enhanced volleyball players' performance compared to unencouraged play. wCE game generally contributed to an enhancement in technical ability. Although wCE did not enhance successful forehand pass skills, enhance other technical skills overall. The findings indicate that wCE may be more advantageous for complex, strategic abilities than for fundamental motor skills.

Conclusion

This study demonstrated that CE improved overall technical performance during matches in young volleyball players. However, CE did not increase HRmax, HRavg, enjoyment, mental effort, successful/unsuccessful forehand pass, unsuccessful overhead pass, or unsuccessful total pass. Increased motivation combined with CE may improve athletes' overall technical performance. Coaches should provide incentives to create a supportive and motivating environment that fosters optimal performance and well-being in volleyball players.

Authors' Contribution

Study Design: RA,; Data Collection: RA; Statistical Analysis: RA; Manuscript Preparation: RA; Funds Collection: RA.

Ethical Approval

The study was approved by the Osmaniye Korkut Ata University of Health Sciences Research Ethics Committee (2025/E.271788) and it was carried out in accordance with the Code of Ethics of the World Medical Association also known as a declaration of Helsinki.

Funding

The authors declare that the study received no funding

Conflict of Interest

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

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