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Effect of verbal encouragement within circuit training on enhancing sport motivation and technical skills among elite cricket athletes

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Received 16 December 2025; Accepted 21 April 2026; Published 28 April 2026
Ed 2026; *11*(1): 105-115

ABSTRACT

Background: Evidence indicates that cricket match results depend on the quality of sport motivation (SM) and technical skills (TS) of elite athletes, and both aspects can be improved through coaches' verbal encouragement during circuit training (CVEdCT). However, limited research has examined the combined effect of verbal encouragement within structured circuit training on both psychological and technical outcomes in cricket. **Objectives:** Our study aims to examine the effect of CVEdCT on improving SM and TS. **Methods:** This study adopted an experiment with a pretest-posttest control group design. We involved 38 elite cricket athletes in this study. Overall, this study was conducted over a period of 9 weeks. The SM and TS aspects were measured at the pretest and posttest stages. **Results:** Our research results show that there is a time × group effect on the SM variable in all indicators of intrinsic motivation (p = 0.007), integrated regulation (p = 0.0012), external regulation (p < 0.001), amotivation (p = 0.010), and TS variables with indicators of batting accuracy (p < 0.001), bowling speed (p = 0.006), bowling accuracy (p < 0.001), and fielding efficiency (p = 0.024). Meanwhile, we observed a time effect on the indicators of intrinsic motivation (p = 0.002), integrated regulation (p = 0.031), external regulation (p = 0.013), and amotivation (p = 0.048). Additionally, the TS variable showed significant effects for the indicators of batting accuracy (p = 0.007), bowling speed (p = 0.003), bowling accuracy (p = 0.011), and fielding efficiency (p = 0.006). Based on the Poshoc Bonferroni analysis, there was a significant effect of both groups on SM and TS, but the increase was greater in CVEdCT than CTG. **Conclusion:** Thus, this study concludes that CVEdCT can improve SM and TS among elite cricket athletes better than CTG.

Keywords: Competitive sports; cricket athlete technique; psychological performance; combination of training

https://doi.org/10.25299/sportarea.2026.vol11(1).26318

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How to Cite: Basri, H., Ridho, A. F., Haqiyah, A., Bujang., & Setiawan, E. (2026). Effect of verbal encouragement within circuit training on enhancing sport motivation and technical skills among elite cricket athletes. *Journal Sport Area*, *11*(1), 105-115. https://doi.org/10.25299/sportarea.2026.vol11(1).26318

Authors' Contributions: a – Study Design; b – Data Collection; c – Statistical Analysis; d – Manuscript Preparation; e – Fundraising

INTRODUCTION

In the context of competitive sports, including cricket, to achieve high performance among elite athletes, coaches need to strive by all means to make the training process much more effective so that the achievement of training goals is much more optimal (Yin et al., 2023). Basically, cricket is an exciting game with fast game intensity (Doma et al., 2021). On the other hand, this game also demands high physical, tactical, technical, and psychological requirements among elite athletes. In the context of professional sports today, psychological aspects and technical skills (TS) are currently the focus of attention and need to be improved as much as possible (Basri et al., 2024).

In recent decades, psychological aspects have become a focus of attention among coaches and have been applied in long-term training sessions (Sakalidis et al., 2023). Basically, psychological factors are reported to play an important role (Melguizo-Ibáñez et al., 2023; Tušak et al., 2022) and contribute greatly to elite athletes being able to undergo training and ultimately achieve success in competitive sports (Alkasasbeh & Akroush, 2025). In addition, previous studies have shown that there are several psychological aspects such as passion (Bento et al., 2024; Cid et al., 2025), involvement and self-efficacy that can affect competitive performance (Lochbaum et al., 2023), including sports motivation (SM). One literature conceptualises SM as a strong drive that comes from within the elite athlete (intrinsic) or from outside (extrinsic) to pursue and actively engage in a sports activity (Eryücel et al., 2024). Intrinsic motivation has goals to be achieved, such as enjoyment, curiosity, strong determination, and satisfaction, while extrinsic motivation focuses on achieving goals such as obtaining prizes, medals, certificates, money, fame, or recognition from coaches, family, friends, partners, or the community (Kovács et al., 2022). SM is based on self-determination theory (SDT), which is the most basic concept for accurately understanding SM (Almagro et al., 2020). SDT conceptualises that a person's behaviour is naturally and proactively motivated to master their social environment or determine their own destiny (Gilic et al., 2024). Previous studies have documented and acknowledged that SM can significantly influence several aspects of elite athletes' performance, such as well-being (Bento et al., 2024), lifestyle (Alecu et al., 2025), and athletic performance (Alkasasbeh & Akroush, 2025). Therefore, it is necessary to further explore SM among elite cricket athletes.

Just as important as the SM aspect, TS must also be optimised as much as possible in elite athletes. In the context of cricket, TS includes batting, bowling and fielding. One previous study acknowledged that TS is crucial for continued training, so it can be a key tool for elite athletes to win competitions (Akdag et al., 2025). Meanwhile, previous studies show that to achieve peak performance, the TS aspect is no less important than the physical, tactical, and psychological aspects, which must be optimised as much as possible (Hidayat et al., 2025).

Given the importance of both aspects between SM and TS, an effective training approach is needed for elite cricket athletes. Evidence indicates that verbal encouragement during training sessions is currently gaining popularity and becoming a trend among coaches in various countries (Hammami et al., 2023; Kilit et al., 2019; Sahli et al., 2020; Selmi, Levitt et al., 2023; Van Hooren et al., 2024). In this context, verbal encouragement from the coach in the form of verbal cues (e.g., positive reinforcement, effort reinforcement, and technical feedback) will be applied in circuit training sessions involving the use of 1-5 stations, each containing different types of exercises in sequence with moderate to high intensity and a minimum rest interval. The combination of verbal encouragement from the coach during circuit training (CVEdCT) can create a new and more meaningful training environment for elite athletes. Referring to SDT theory, the coach's behaviour or verbal cues during training can be the main trigger for the emergence of an SM for elite athletes to actively engage in an activity and ultimately allowing for higher TS influence (Yılmaz et al., 2025).

Previous literature reviews have shown that coaches' verbal encouragement during training has been proved to have a positive impact and has been studied by several researchers. However, investigations into the aspects of SM and TS among elite cricket athletes are still rare, as previous studies have focused more on the context of swimming (Puce et al., 2022), soccer (Ridwan et al., 2025), volleyball (Hidayat et al., 2025), basketball (Yılmaz et al., 2025), and one researcher focused on improving the physical fitness of university students (Romdhani et al., 2024). Additionally, another gap lies in the lack of previous researchers attempting to combine verbal encouragement during circuit training. Therefore, this study aims to examine the effects of

verbal encouragement within circuit training on sport motivation and technical skills among elite cricket athletes. We hypothesise that CVEdCT will result in higher increases in SM and TS compared to the control training group (CTG).

METHOD

Participants

The participants of this study were elite cricket athletes registered with the Indonesian national sports committee in the Bekasi region. Inclusion criteria included (i) being (i) male or female, aged 14-17 years; (ii) having practised cricket for at least 2 years; (iii) not having experienced any injuries in the last 6 months; and (iv) being willing to participate in the entire study.

Based on the power analysis calculation using G*Power 3.1.9.7 with an effect size of 0.25, alpha 0.05, and power 0.80 for the analysis of a two-way repeated-measures ANOVA, the minimum sample size required is 32 participants. Taking into account the possibility of a 2% dropout rate, the total sample to be recruited was 38 athletes who were then divided into an experimental group (CVEdCT, n = 19) and a control training group (CTG, n = 19). The characteristics of the elite athletes are presented in **Table 1**.

Table 1. The Characteristics of the Elite Athletes

Characteristics	CVEdCT Group (n = 19)	CTG (n = 19)	p
Age (years)	15.2±1.1	15.1±1.2	0.78
Exercise Experience (years)	4.2±1.3	4.1±1.6	0.83
Height (cm)	169.8±5.4	169.2±6.8	0.75
Body Weight (kg)	70.1±5.8	70.9±7.2	0.69

Notes: CVEdCT: Coach verbal encouragement during circuit training; CTG: Control training group.

Measurements

Motivation to practise is measured using the Indonesian version of the Sport Motivation Scale-II (SMS-II). The instrument measures four dimensions of motivation: (i) (i) intrinsic motivation (e.g., “I always practise cricket diligently”); (ii) integrated regulation (e.g., “I am committed to becoming a professional cricket athlete because I want to make my parents proud”); (iii) external regulation (e.g., “I always attend cricket training sessions because I don’t want to be punished by the coach”); and (iv) amotivation (e.g., “I feel no desire or passion to practise cricket”) (Gilic et al., 2024). To answer all questionnaire items, a Likert scale from 1 (I strongly disagree with that) to 5 (I strongly agree with that) can be used. All instruments have undergone a validity and reliability testing process in the context of Indonesian culture by involving 50 cricket athletes in pilot studies.

Technical performance measurement in cricket uses a battery of cricket skills tests that have been validated, including tests of (i) batting accuracy, according to Doma et al. (2021). Participants are instructed to throw and hit a target or coloured zone. In addition, scoring is done by assessing the accuracy of the throw, for example, three points if the ball lands in the correct coloured zone, two points if the ball lands in an adjacent coloured zone, and one point if the ball lands in the coloured zone furthest from the targeted coloured zone. Finally, a score of zero is given when the ball lands outside the entire target area (Figure 1). (ii) bowling speed and accuracy, (iii) fielding efficiency. Each skill component is measured using a standard protocol with Cronbach's alpha reliability > 0.85. Anthropometric data, including height, weight and body composition, were measured using bioelectrical impedance analysis for the characterisation of the research sample.

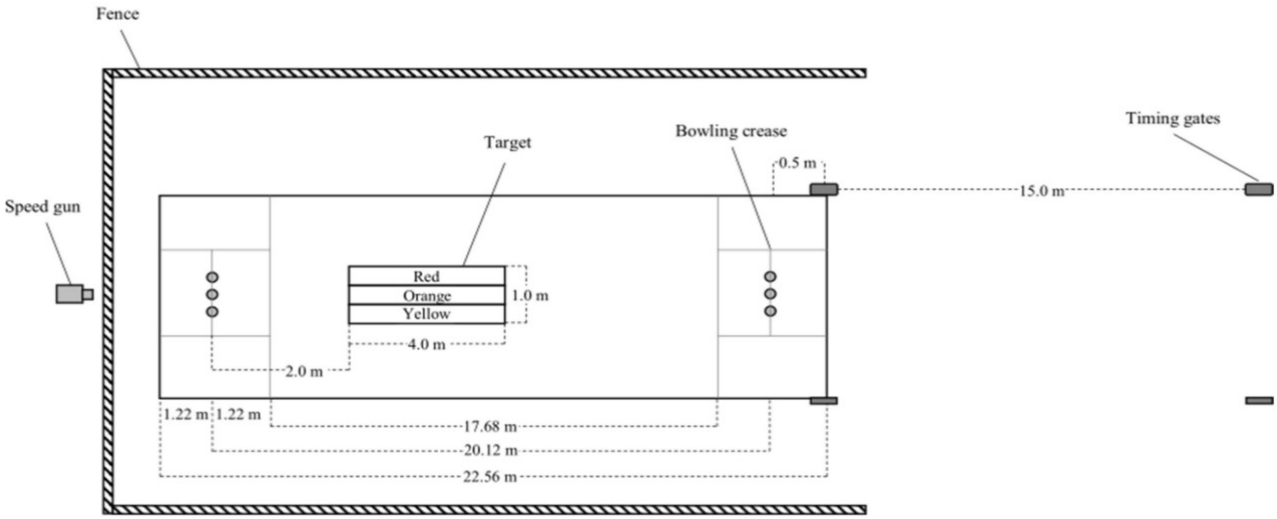

Figure 1. Batting Accuracy Test Field
Source: Doma et al. (2021)

Procedure

The experimental study used a pretest-posttest control group design and was conducted in August-September 2025 at the Bekasi regional national sports committee (approval from the ethics committee of the Bekasi regional national sports committee with number 456/KONI-Bekasi/2025). Before the start of the experimental session, anthropometric characteristics were assessed. In the first week, the elite athletes carried out a pretest activity, namely filling out the SM questionnaire from 7:00 to 8:00 a.m., followed by a TS test with a cricket skills test battery, including tests: (i) (i) batting accuracy, (ii) bowling speed and accuracy, and (iii) fielding efficiency from 9:00 to 11:00 a.m. In the second to eighth weeks, the CVEdCT programme was implemented during the cricket training schedule, specifically from 7:00 to 8:00 a.m. In addition, the CVEdCT programme was carried out by elite athletes with 3 sessions (Monday, Thursday, and Saturday). In the ninth week, all participants in the CVEdCT and CGT groups were instructed to complete the SM questionnaire and TS test again with the same rules and schedule as the pretest stage. We involved three national cricket coaches from the Bekasi area to assist in the implementation of the pretest, intervention programme (CVEdCT vs CGT), and posttest. For a clearer understanding of the experimental research design flow, we present it in **Figure 1**.

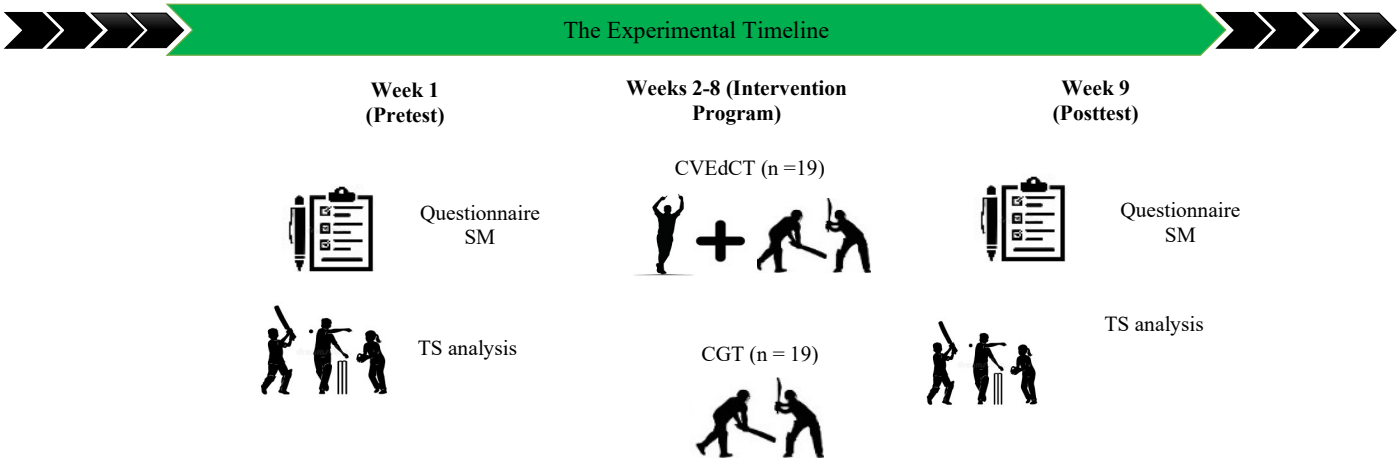

Figure 2. Study Design
Notes: SM: Sport motivation; TS: Technical skills; CVEdCT: Coach verbal encouragement during circuit training; CTG: Control training group.

CVEdCT programme

Verbal encouragement is given to athletes during circuit training sessions. According to previous studies, verbal encouragement given to athletes includes three types, namely (i) positive reinforcement (e.g., "Good job!" or "Keep it up!"), (ii) effort reinforcement (e.g., "Stay focused!" or "Hit harder!"), and (iii) technical feedback (e.g., "Find the right position!" or "Chase the ball quickly!"). For more details about the CVEdCT programme, see **Table 2**.

Table 2. CVEdCT Programme

Weeks	Coach's Verbal Encouragement	Circuit Training Activities	Set(rep)	Training Duration
1-2	Positive reinforcement (e.g., "Good job!" or "Keep it up!"	Warm-up		5 min
		Station 1 (Push-up Exercise)	2 reps x 10 sets	10 min
		Station 2 (Pull-Up Exercise)	2 reps x 10 sets	10 min
		Station 3 (Batting Technique Exercise)	2 reps x 10 sets	10 min
		Game		20 min
		Cool-down		5 min
3-4	Encouragement (e.g., "Stay focused!" or "Hit harder!")	Warm-up		5 min
		Station 1 (Dumbbell exercise)	3 reps x 10 sets	5 min
		Station 2 (Tire Toss Exercise)	3 reps x 10 sets	5 min
		Station 3 (Batting technique training)	3 reps x 10 sets	10 min
		Station 4 (Bowling technique training)	3 reps x 10 sets	10 min
		Game		20 min
		Cool-down		5 min
5-6	Technical feedback (e.g., "Find the right position!" or "Chase the ball quickly!"	Warm-up		5 min
		Station 1 (Kettlebell exercise)	2 reps x 10 sets	5 min
		Station 2 (Plank to push-up)	2 reps x 10 sets	5 min
		Station 3 (Batting technique training with target practice)	2 reps x 10 sets	5 min
		Station 4 (Bowling technique practice with target)	2 reps x 10 sets	5 min
		Station 5 (Pair fielding technique training)	2 reps x 10 sets	5 min
		Game		25 min
		Cool-down		5 min
7-8	Combined verbal encouragement including positive reinforcement, effort reinforcement, and technical feedback	Warm-up		5 min
		Game session 1	15 min (5 min break between games)	
		Game session 2	10 min (5-minute break between games)	
		Game session 3	10 min (5-minute break between games)	
		Cool-down		5 min

CTG Programme

Participants in the CTG group performed traditional exercises without verbal encouragement from the coach. The session lasted approximately 60 minutes, consisting of (i) a standard 10-minute warm-up, (ii) 20 minutes of drill exercises, (iii) 20 minutes of games, and (iv) a 10-minute cool-down.

Statistical Analysis

We used Jamovi v.2.3.2 (The Jamovi Project, Sydney, Australia) to analyse the mean and standard deviation values. In addition, we tested the validity of the values using Pearson's correlation (r) and the reliability using Cronbach's alpha for each instrument. Furthermore, we tested the normality (Shapiro-Wilks) and homogeneity (Levene Test) of the data. Analysis of Two-Way Repeated Measures ANOVA was used to analyse the main effects of exercise (CVEdCT vs. CTG), time (pretest vs. posttest) and interaction. The magnitude of effects for ηp^2 was interpreted as small (< 0.06), moderate (> 0.06-0.13), and large (> 0.14). Bonferroni-adjusted pairwise comparisons were conducted to determine the specific differences between conditions where significant main or interaction effects were found. The significance level was set at 0.05.

RESULTS AND DISCUSSION

Results

Table 3 shows the validity scores for each instrument, ranging from 0.80 to 0.90, while we observed reliability scores ranging from 0.77 to 0.96. Thus, it can be interpreted that the SM and TS instruments can be said to have high validity and reliability. In addition, we observed that the normality test obtained high results ranging from 0.072 to 0.213, while homogeneity ranged from 0.136 to 0.231 (see **Table 4**).

Table 3. Validity and Reliability Test Results

Variable	Pearson Correlation (r)	Cronbach's alpha
SM		
Intrinsic Motivation	0.87	0.82
Integrated Regulation	0.90	0.80
External Regulation	0.88	0.81
Amotivation	0.80	0.77
TS		
Batting	0.84	0.80
Bowling	0.90	0.96
Fielding	0.86	0.82

Notes: SM: Sport Motivation; TS: Technical Skills.

Table 4. Normality and Homogeneity Test Results

Variable	Shapiro-Wilks (*p*-values)	Levene's Test (*p*-values)
SM		
Intrinsic Motivation	0.123	0.164
Integrated Regulation	0.089	0.136
External Regulation	0.072	0.231
Amotivation	0.213	0.189
TS		
Batting	0.074	0.193
Bowling	0.089	0.200
Fielding	0.148	0.172

Notes: SM: Sport Motivation; TS: Technical Skills.

The Effect of Both Training on SM

Based on **Table 5**, there is a time × group effect on the SM variable with the indicators of intrinsic motivation ($F = 28.67$; $p = 0.007$; $\eta^2p = 0.44$ [large]), integrated regulation ($F = 31.8$; $p = 0.0012$; $\eta^2p = 0.47$ [large]), external regulation ($F = 19.73$; $p < 0.001$; $\eta^2p = 0.35$ [large]), and amotivation ($F = 22.41$; $p = 0.010$; $\eta^2p = 0.38$ [large]). Meanwhile, we observed a time effect on the intrinsic motivation indicator ($F = 32.67$; $p = 0.002$; $\eta^2p = 0.13$ [moderate]), integrated regulation ($F = 43.54$; $p = 0.031$; $\eta^2p = 0.35$ [large]), external regulation ($F = 38.21$; $p = 0.013$; $\eta^2p = 0.27$ [large]), and amotivation ($F = 31.86$; $p = 0.048$; $\eta^2p = 0.10$ [moderate]). Additionally, Bonferroni-pairwise comparisons analysis showed that the increase in SM was higher in CVEdCT than in CGT for all indicators in SM.

Table 5. Changes in SM from Pretest to Posttest Between the Two Groups

SM Dimension	Group	Pretest (M±SD)	Posttest (M±SD)	Time × group F; p-value; η^2p	Time F; p-value; η^2p	Bonferroni-pairwise comparisons
Intrinsic Motivation	CVEdCT (n = 19)	18.4 ± 2.8	23.8 ± 2.3	28.67; 0.007; 0.44	32.67; 0.002; 0.13	< 0.001
	CGT (n = 19)	18.1 ± 3.1	20.4 ± 2.9			< 0.005
Integrated Regulation	CVEdCT (n = 19)	16.8 ± 2.4	21.4 ± 2.1	31.84; 0.0012; 0.47	43.54; 0.031; 0.35	< 0.001
	CGT (n = 19)	16.9 ± 2.6	18.6 ± 2.4			0.008
External Regulation	CVEdCT (n = 19)	12.4 ± 2.1	10.1 ± 1.7	19.73; < 0.001; 0.35	38.21; 0.013; 0.27	< 0.001
	CGT (n = 19)	12.3 ± 2.3	11.7 ± 2.0			0.021
Amotivation	CVEdCT (n = 19)	8.2 ± 1.8	6.3 ± 1.4	22.41; 0.010; 0.38	31.86; 0.048; 0.10	< 0.001
	CGT (n = 19)	8.1 ± 1.9	7.6 ± 1.6			0.029

Notes: SM: Sport motivation; CVEdCT: Coach verbal encouragement during circuit training; CTG: Control training group; M: Mean; SD: Standard deviation.

The Effect of Both Training on TS

We observed that there was an interaction effect between time × group on the TS variable with the indicators of batting accuracy (F = 28.47; $p < 0.001$; $\eta^2p = 0.17$ [large]), bowling speed (F = 18.92; $p = 0.006$; $\eta^2p = 0.20$ [large]), bowling accuracy (F = 24.83; $p < 0.001$; $\eta^2p = 0.36$ [large]) and fielding efficiency (F = 31.16; $p = 0.024$; $\eta^2p = 0.48$ [large]). We observed similar results, namely that there was a time effect in each indicator of batting accuracy (F = 24.21; $p = 0.007$; $\eta^2p = 0.42$ [large]), bowling speed (F = 28.87; $p = 0.003$; $\eta^2p = 0.19$ [large]), bowling accuracy (F = 31.05; $p = 0.011$; $\eta^2p = 0.27$ [large]), and fielding efficiency (F = 19.77; $p = 0.006$; $\eta^2p = 0.16$ [large]). In addition, Bonferroni-pairwise comparisons analysis showed that the increase in TS was higher in CVEdCT than in CGT for all indicators in SM (**Table 6**).

Table 6. Changes in TS from Pretest to Posttest Between the Two Groups

TS analysis	Group	Pretest (M±SD)	Posttest (M±SD)	Time × group F; p-value; η^2p	Time F; p-value; η^2p	Bonferroni-pairwise comparisons
Batting Accuracy (/30)	CVEdCT (n = 19)	18.4 ± 3.6	24.8 ± 3.2	28.47; < 0.001; 0.17	24.21; 0.007; 0.42	< 0.001
	CGT (n = 19)	17.9 ± 2.8	20.4 ± 3.4			0.043
Bowling Speed (km/h)	CVEdCT (n = 19)	70.2 ± 5.1	75.8 ± 5.4	18.92; 0.006; 0.20	28.87; 0.003; 0.19	< 0.001
	CGT (n = 19)	68.8 ± 4.7	71.2 ± 5.9			< 0.033
Bowling Accuracy (/30)	CVEdCT (n = 19)	18.1 ± 2.6	22.7 ± 3.1	24.83; < 0.001; 0.36	31.05; 0.011; 0.27	0.004
	CGT (n = 19)	17.2 ± 3.8	19.8 ± 4.5			0.028
Fielding Efficiency (/30)	CVEdCT (n = 19)	15.7 ± 3.2	20.3 ± 3.1	31.16; 0.024; 0.48	19.77; 0.006; 0.16	< 0.001
	CGT (n = 19)	16.8 ± 3.9	18.7 ± 4.1			0.017

Notes: TS: Technical skills; CVEdCT**:** Coach verbal encouragement during circuit training; CTG: Control training group; M: Mean; SD: Standard deviation.

Discussion

Our current study aims to investigate the effects of applying CVEdCT compared to CGT on SM and TS among elite cricket athletes. Our main findings confirm that CVEdCT has a greater effect than CGT in improving SM and TS aspects among elite cricket athletes. This is because CVEdCT is a methodology that combines two principles: verbal encouragement from coaches and the use of circuit training with five stations (each station has a different type of exercise). With this combination, our study found that SM, which was initially low, changed to a higher level. This is in line with SDT theory, where motivation increases when receiving positive feedback and engaging training. The findings in our study are in line with several previous studies; for example, Hidayat et al. (2025) applied verbal encouragement from coaches during small sided volleyball training sessions, and the results showed a significant increase in physical fitness, technique, and tactics among elite athletes. Furthermore, similar results were also reported by Ridwan et al. (2025), who applied verbal encouragement from coaches during large sided games training sessions to female soccer athletes. The results proved that several psychological aspects, such as physical activity enjoyment and satisfaction, experienced changes in a positive direction.

Basically, combining verbal encouragement with circuit training provides positive benefits. For example, we observed elite cricket athletes who were initially not very motivated to train, but after the training session began and the CVEdCT programme was implemented, there was a noticeable change in the behaviour of elite athletes, who became more motivated to be active and involved in all types of training provided by the coach. We obtained similar results from a previous study, where the provision of feedback in the form of verbal encouragement from coaches triggered and became a positive stimulus for the development of training motivation among athletes (Nurudin et al., 2025). Meanwhile, Sahli et al. (2024) involved randomised crossover design research on sports science students to apply verbal encouragement during training, and the results showed that the students' affective responses increased significantly. One researcher also supports the findings of our current study, where verbal encouragement during training can be an effective method that coaches can use to improve the technical performance and psychological quality of soccer players (Sahli et al., 2024). Meanwhile, previous studies have attempted to integrate verbal encouragement into various types of training, and the results have all shown a high level of positive impact in changing several important aspects related to psychophysiological responses (Romdhani et al., 2024), motivation and technical performance

(Basri et al., 2024; Yılmaz et al., 2025). Additionally, the findings in the study (Selmi, Jelleli et al., 2023) attempted to apply verbal encouragement during repeated agility speed training sessions, and the results of the study showed that the psychophysiological responses, mood, and enjoyment of soccer players increased to higher levels than before. Essentially, verbal encouragement has been proven effective based on the findings of this study when combined with any type of training, including in the context of this study involving a 5-station circuit training. Two previous experimental studies reported that circuit training also has several benefits, such as improving physical fitness (Pugliese et al., 2025), and performance (Belli et al., 2022). This serves as the basis and evidence that our current research findings are in line with previous studies and adds to the literature on verbal encouragement given by coaches during circuit training sessions.

Our other findings show that CGT also has a positive impact on the SM and TS development of elite cricket athletes but not as high as in the CVEDCT group. This is because CGT is a training method that was often used by elite athletes before the advent of CVEdCT, so it has become a habit for these athletes. The characteristic of CGT is that it provides repetitive movement training to elite athletes, which is the main factor why the SM and TS of athletes can improve. Referring to movement theory, repetitive training day after day creates movement automation. This is consistent with previous research, which found that drill training can improve shot accuracy in tennis athletes (Mulya et al., 2025).

The main strengths of this study are, first, the design of a programme that combines verbal encouragement during sports training for elite cricket athletes. The second strength is that the CVEDCT programme, based on our findings, has been proved to improve SM and TS aspects. Third, we re-tested our SM instrument for validity and reliability using Indonesian. In addition, we re-tested our TS instrument and obtained high validity and reliability scores. However, we found that there are still limitations in our study: (i) sample size, (ii) no long-term follow-up, and (iii) no physiological mediator.

CONCLUSION

Based on the results of the research and discussion, we conclude that the application of CVEdCT through pretest-posttest control group design has been proven to improve SM and TS aspects among elite cricket athletes. This research contributes to important literature for cricket coaches to improve the quality of SM and TS of athletes so that in the future, it may contribute to improved performance in achieving achievements at the national and international levels.

ACKNOWLEDGEMENTS

First, we would like to thank the participants who have agreed to take part in our current research. In addition, we would also like to thank the parents of the participants for giving their permission.

CONFLICT OF INTEREST

No conflict of interest.

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