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The relationship between coach support and exercise habits on engagement and sports success: A focused study among young table tennis athletes

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ABSTRACT

Background: Engagement and sports success are two important aspects for young athletes in various sports including table tennis, but there is still limited research reporting on factors that can influence these two aspects. **Objectives**: This study investigates the relationship between coach support and exercise habits with engagement and sports success among young table tennis athletes. **Methods**: This study adopted a correlational research method to reveal the relationship between each variable. Participants included young table tennis athletes (n = 50), who were assigned to complete questionnaires on coach support, exercise habits, engagement, and sports success. **Finding/Results**: The study results are as follows. First, a strong positive correlation was observed ranging from r = 0.72* to r = 0.95*, indicating that higher levels of perceived coach support are associated with greater engagement. Meanwhile, correlations ranged from from r = 0.48* to r = 0.87*, indicating a moderate to strong relationship between coach support and sports success. Second, a significant correlation was found, ranging from r = 0.45* to r = 0.92*, demonstrating that consistent exercise habits contribute to higher engagement. Meanwhile, correlations ranged from r = 0.45* to r = 0.87*, indicating a moderate to strong relationship between exercise habits with sports sports. **Conclusion**: The results highlight the importance of coach support and exercise habits in fostering engagement and enhancing sports success among young table tennis athletes. A limitation of our study is the relatively small number of participants, consisting only of young table tennis athletes. Therefore, we recommend that future research include participants from other sports, such as tennis, badminton, or sepak takraw.

Keywords: Athlete support and habits; exercise engagement; sports success; young tennis athletes

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

INTRODUCTION

Table tennis is a competitive sport that is currently gaining popularity worldwide. Within this sport, two primary motivational goals are essential for young athletes to achieve optimally: training engagement and sports success. Engagement is theoretically defined as the willingness of young athletes to actively participate in training sessions (Gu et al., 2023; Wang et al., 2024). Athletes with high engagement typically demonstrate positive behaviors such as enthusiasm, confidence, dedication and vigor during training (Jiang et al., 2025; Wan et al., 2025). In contrast, those with low engagement tend to be passive, unmotivated, bored, and less committed (Raimundi et al., 2024). Empirical evidence suggests that most young athletes who compete successfully in sports benefit from strong engagement in training (Liu et al., 2024; Tannoubi et al., 2025). Furthermore, the facts in China show that athlete involvement is considered an effective way in predicting positive mentality and engagement in sports (Huang et al., 2025). Several researchers concur that greater engagement in training significantly enhances the likelihood of achieving peak performance (Kuokkanen et al., 2024; Schellenberg & Lötscher, 2024; Ziyou et al., 2024). Sports success serves as a tangible indicator of performance, encompassing elements such as flow state, technical skill, sensitivity, commitment, and achievement (Rogowska et al., 2022). However, previous studies have shown that only a small proportion of young athletes transition successfully to the senior level, highlighting the need to understand the underlying factors that influence long-term success (Bezuglov et al., 2022; Rodriguez-Gomez et al., 2024). Apró et al. (2024) emphasized that identifying predictors of success and failure in youth sports is currently one of the most critical and compelling topics among professional coaches. Accordingly, it is estimated that key factors influencing athlete engagement and sports success include coach support and exercise habits.

Coach support refers to the supportive behaviors provided by coaches to young athletes during training sessions (Huang, 2023; Nurudin et al., 2025). The literature distinguishes two key dimensions of coach support: perceived coach support and received coach support (Coussens et al., 2025). In recent years, coach support has gained prominence and has been integrated into various sports training programs (Ricketts et al., 2024). For instance, prior research has identified coach support as a crucial moderating factor influencing sport passion and the intention to continue training (Kim, 2022). Supportive coaching during training is essential for creating a harmonious and conducive environment, which in turn fosters the development of multiple athlete attributes, including physical fitness (Hidayat et al., 2025), tactical and technical proficiency (Ferreira et al., 2024). Moreover, coach support enhances communication and mutual understanding, promoting effective collaboration between coaches and young athletes (Choi et al., 2020; Kim & Choi, 2024). It also contributes to heightened motivation and commitment levels (Sevil-Serrano et al., 2021). In the context of competitive sports, where tension and conflict among athletes may arise, coach support plays a pivotal role in boosting self-confidence and mitigating aggressive behaviors (Marks et al., 2022).

Conceptually, a habit refers to a behavioral pattern that is consistently repeated on a daily basis. In the context of sports training, habit training can be defined as the long-term behavioral routine of young athletes during training sessions (Santos et al., 2025). Currently, the topic of exercise habits among youth athletes has garnered significant interest among sports coaches and has been explored across multiple disciplines, including physical education (Akbaruddin et al., 2025), psychology and medicine (Singh et al., 2024), and has expanded in competitive sports settings (García-Pinillos et al., 2020). Research has demonstrated the positive effects of strong exercise habits such as regular weekly strength training on weight loss and improved health (Ma et al., 2023). Fundamentally, consistent training habits serve as reliable predictors of competitive performance and athletic success (Kozlovskaia et al., 2019). Young athletes who maintain robust exercise routines (e.g., training three times per week) are more likely to develop essential physical attributes (Demeco et al., 2025). Conversely, poor exercise habits are associated with diminished performance and reduced likelihood of reaching peak competitive levels (Brumitt et al., 2020).

The Present Study

To the best of the author's knowledge, numerous studies in the sports domain have investigated coach support (Coussens et al., 2025; Hidayat et al., 2025; Huang, 2023) and exercise habits independently (Kozlovskaia et al., 2019). However, limited research has explored the combined relationship between coach

support and exercise habits in relation to training engagement and sports success, particularly among young table tennis athletes. This gap highlights the need for a follow-up study to examine the interplay between these variables. Therefore, the present study aims to analyze the relationship between coach support and exercise habits on engagement and sports success in young table tennis athletes.

METHOD

Study Design and Ethics Approval

This study involved a correlational research design to examine the relationships among the variables under investigation. The research protocol was approved from the Local Ethics Committee of Padang State University (Registration No. 1656/UNP/2025). Prior to the commencement of the research activities, the research team provided a verbal explanation to the elite athletes and their parents regarding the voluntary nature of participation, the right to withdraw at any time, the confidentiality of participant data, and the potential risks and benefits of the study. Following this briefing, written informed consent was obtained from all participants. The study was conducted in compliance with the ethical principles outlined in the 2013 Declaration of Helsinki.

Sample Size Calculation

In our correlational study, we performed a sample size analysis using the G*Power program (v. 3.1.9.3, Düsseldorf, Germany). The a priori power analysis included: Tail (two), effect size (0.5), α err prob (0.05), power (1-β err prob) (0.90). This analysis yielded a minimum sample size requirement (n = 34). Considering the loss of participants due to inclusion criteria, the research team decided to recruit additional participants with a final sample size (n = 70).

Inclusion Criteria

In this study, young athletes were required to meet specific inclusion criteria to be eligible for participation. The criteria included: (i) submission of a parental consent letter, (ii) age between 16 and 19 years, (iii) absence of any fatal injuries, (iv) no history of chronic diseases, particularly cardiac conditions, and (v) no current participation in national or international championships. Based on the initial screening process, 20 athletes were excluded for not meeting these criteria. Consequently, 50 young athletes were selected to take part in all phases of the study.

Participants

The participants were young male table tennis athletes from Padang State University (Indonesia). We excluded young female participants because they were participating in a national championship event. **Table 1** shows information regarding the characteristics of the young athletes.

Table 1. The Characteristics of the Young Athletes (N = 50)

Age (years) (X ± SD)	Height (cm) (X ± SD)	Weight (kg) (X ± SD)	BMI (kg/m^2) (X ± SD)	Practice experience (years) (X ± SD)
17.6 ± 0.881	160 ± 3.17	58.4 ± 2.48	21.7 ± 0.858	1.84 ± 0.584
p = 0.90	p = 0.92	p = 0.77	p = 0.66	p = 0.79

Note. X = mean; SD = standard deviation; BMI = body mass index.

Measurements

Demographic data sheet and anthropometric measurements. This activity was conducted two days before the research program started. The participants filled out a data sheet, general demographic information such as age and table tennis training experience. In addition, we conducted anthropometric measurements related to height (to the nearest 0.1 cm using the Harpenden Portable Stadiometer, Holtain, England), weight (to the nearest 0.01 kg using the BC-418 MA, Tanita Corp®, Tokyo, Japan), and body mass index (BMI) (body mass = (kg)/height² (m).

Coach's support. To assess coach support in this study, we adopted the measurement framework proposed by Coussens et al. (2025), which encompasses two key dimensions: (i) the Perceived Available Support Questionnaire, consisting of 16 items. Sample items include: "Provide you with comfort and security?" and "Boost your sense of competency?." Responses are rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (often). (ii) the Athletes' Received Support Questionnaire, comprising 22 items. For example: "In the last 4 weeks, how often has your coach encouraged you and listened to your complaints about the training program?". This questionnaire also uses a 5-point Likert scale, ranging from 1 (never at all) to 5 (often or more than seven times). The overall coach support score was calculated by summing all item responses across both dimensions. A higher total score reflects a greater level of coach support perceived and received by young athletes.

Exercise habits. Based on previous research, the measurement of exercise habit quality in this study was adapted from the Self-Report Behavioral Automaticity Index (Teixeira et al., 2022). The questionnaire was modified to suit the context of training habits among young table tennis athletes and, following validation, consists of 15 items grouped into two dimensions: (i) Training habits in camp (7 items), with examples such as "I train harder than others," "I keep training even when I have problems with the coach," and "I stay focused on training hard, even when the coach scolds me," and (ii) Independent training habits at home (8 items), including statements like "I have to train independently at home diligently" and "I remain enthusiastic even when training at home." All items are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total exercise habits score is calculated by summing responses across all items, with higher scores indicating stronger and more consistent training habits.

Engagement. Several previous studies have reported that to measure the level of engagement in training, can use the Athletic Engagement Questionnaire (Manullang et al., 2025). The Athletic Engagement Questionnaire has 16 items representing four dimensions: (i) Self-confidence (4 items), for example: "I believe in my own abilities," (ii) Dedication (4 items), for example: "I always train diligently to achieve my goals," (iii) Vigor (4 items), for example: "I am always enthusiastic about training, even in hot weather," and (iv) Enthusiasm (4 items), for example: "I am very enthusiastic every time I have a training session with my coach and friends." All items are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total engagement score is calculated by summing responses to all items, with higher scores indicating a greater level of athlete engagement.

Sports success. In this study, based on previous studies, the Sports Success Scale (SSS) has been proven effective and valid for assessing how successful athletes are in sports (Rogowska et al., 2022). The SSS is reported to have 29 statement items from six dimensions, including: (i) Flow State (5 items), example statement: "training is interesting, fun and meaningful for me," (ii) Attention (5 items), example statement: "When I am training, no one is allowed to disturb me", (iii) Technique (5 items), example statement: "I must have high technical performance," (iv) Sensitivity to error (5 items), example statement: "I must be careful in performing skills and decision-making," (v) Commitment (5 items), example statement: "I must train hard" and (vi) Achievement (4 items), example statement: "I must achieve peak performance." This statement item can be answered by using six-point Likert-type scale (1 = "Strongly disagree," 6 = "Strongly agree"). The total SSS ranges from 29 to 174, and higher scores indicate a better personal predisposition to sports success.

Procedure

This study was conducted from August 27 to 30, 2025, at the field site of Padang State University. The research activities involved testing and measuring four key variables: coach support, exercise habits, engagement, and sports success. Data collection was organized into four structured sessions: Session 1: Held on August 27, 2025, from 9:00 to 11:00 a.m., during which participants completed the Coach Support Questionnaire. Session 2: Conducted on August 28, 2025, at the same time as the previous session, where participants filled out the Exercise Habits Questionnaire. Session 3: On August 29, 2025, participants completed the Engagement Questionnaire, again from 9:00 to 11:00 a.m. Session 4: Finalized on August 30, 2025, with participants completing the Sports Success Questionnaire during the same time window. Throughout each session, the research team provided direct supervision to ensure that all participants

responded objectively and consistently. The full procedure of this correlational research is illustrated in **Figure 1**.

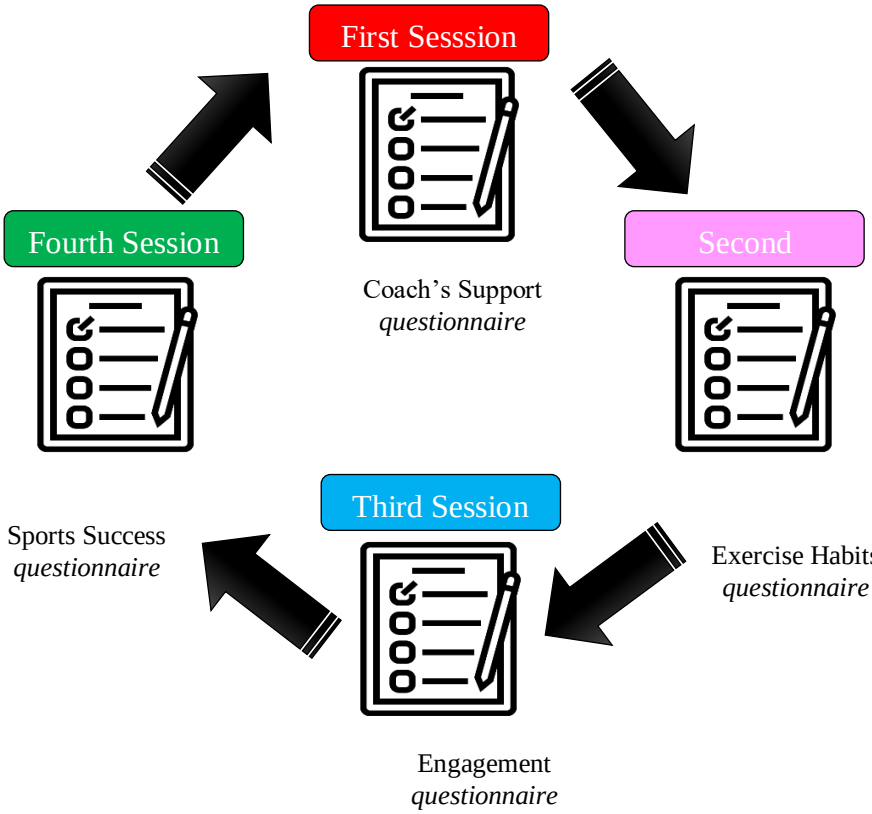

Figure 1. Schematic of the Test Session

Data collection

In current research, data collection was carried out by filling out questionnaires on coach's support, exercise habits, engagement and sports success, which had been tested for correlation coefficients and coefficients of variation by researchers.

Statistical analysis

Data collected from the assessment results on the variables of coach's support, exercise habits, and engagement and sports success will be analyzed to find the mean (X) ± standard deviation (SD). Furthermore, we analyzed the reliability of each instrument through correlation coefficients and coefficients of variation. We continued by analyzing confidence intervals, normality, and homogeneity. The final stage, to analyze the relationship between our variables, involved the use of statistical software Jamovi v.2.3.2 (The Jamovi project, Sydney, Australia) and Origin Pro v. 10.25 (OriginLab Corporation, Northampton, United States). The strength of the correlation in each variable was determined: small (< 0.29), moderate (0.3-0.49), large (0.5-0.69), or very large (> 0.7) (Gidu et al., 2022; Alexe et al., 2024). The significance level was set at 0.05.

RESULTS AND DISCUSSION

The results of the reliability test using the ICC showed values ranging from 0.73 to 0.95. Meanwhile, the CV ranged from 7.9 to 16.8%. Meanwhile, the normality test using the SW obtained values ranging from 0.075 to 0.324, while the homogeneity test ranged from 0.115 to 0.421 (**Table 2**). Meanwhile, **Table 3** shows the descriptive statistical values including the mean, SD, min, max, skewness, and kurtosis of each variable and its dimensions.

Table 2. Intraclass Correlation Coefficient, Confidence Interval, Coefficient of Variation, Normality and Homogeneity of Each Variable

Variable	ICC	CV (%)	(95% CI)	SW	LT
Coach's Support					
Perceived available support	0.87	15.9	0.102-0.778	0.080	0.126
Athletes' received support	0.80	8.4	0.111-0.865	0.092	0.188
Exercise Habits					
Exercise habits at camp	0.73	7.9	0.378-0.486	0.177	0.221
Exercise habits at home	0.83	12.2	0.115-0.788	0.245	0.289
Engagement					
Self-confident	0.94	15.5	0.695-0.955	0.267	0.321
Dedication	0.95	16.8	0.702-0.959	0.193	0.421
Vigor	0.87	12.2	0.115-0.788	0.245	0.289
Antusiasme	0.78	9.7	0.101-0.756	0.075	0.115
Sports Success					
Flow State	0.82	13.6	0.117-0.787	0.097	0.154
Attention	0.77	8.4	0.100-0.743	0.132	0.244
Technique	0.94	16.1	0.700-0.950	0.237	0.311
Sensitivity to error	0.90	15.2	0.654-0.844	0.324	0.377
Commitment	0.91	16.7	0.687-0.898	0.298	0.291

Note. ICC: intraclass correlation coefficients; CI: confidence intervals; CV: coefficients of variation; SW: shapiro-wilks; LT: levene test.

Table 3. Descriptive Statistics between Variables

Variable	Dimensions	n	X ± SD	Sum
Coach's Support	Perceived available support	50	23.14 ± 1.7	1157
	Athletes' received support	50	23.26 ± 1.45	1163
Exercise habits	Exercise habits at camp	50	22.78 ± 1.47	1139
	Exercise habits at home	50	22.96 ± 1.58	1148
Engagement	Self-confident	50	23.24 ± 1.53	1162
	Dedication	50	23.36 ± 1.64	1168
	Vigor	50	23.04 ± 1.7	1152
	Antusiasme	50	23.02 ± 1.67	1151
Sports Success	Flow State	50	22.82 ± 1.66	1141
	Attention	50	22.96 ± 1.67	1148
	Technique	50	23.26 ± 1.7	1163
	Sensitivity to error	50	23.26 ± 1.61	1163
	Commitment	50	24.12 ± 1.49	1206

Note. n: Participants; X: Mean; SD: standard deviation.

The relationship between coach's support and engagement

The correlational analysis presented in **Table 4** reveals a statistically significant relationship between each dimension of the coach support variable and engagement ($p < 0.0001$). The strength of these correlations falls within the strong category, with coefficients ranging from r = 0.72* to r = 0.95*.

Table 4. Correlation between Coach's Support and Engagement

Variables		Perceived available support	Athletes' received support	Self-confident	Dedication	Vigor	Enthusiasm
Perceived available support	Pearson Corr.	1	0.78*	0.94*	0.95*	0.72*	0.94*
	p-value	--	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Athletes' received support	Pearson Corr.	0.78*	1	0.78*	0.72*	0.54*	0.74*
	p-value	< 0.0001	--	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Self-confident	Pearson Corr.	0.94*	0.78*	1	0.90*	0.67*	0.92*
	p-value	< 0.0001	< 0.0001	--	< 0.0001	< 0.0001	<0.0001
Dedication	Pearson Corr.	0.95*	0.72*	0.90*	1	0.68*	0.91*
	p-value	< 0.0001	< 0.0001	< 0.0001	--	< 0.0001	< 0.0001
Vigor	Pearson Corr.	0.72*	0.54*	0.67*	0.68*	1	0.78*

Variables		Perceived available support	Athletes' received support	Self-confident	Dedication	Vigor	Enthusiasm
	p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	--	< 0.0001
Antusiasme	Pearson Corr.	0.94*	0.74*	0.92*	0.91*	0.78*	1
	p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	--

2-tailed test of significance is used
*: Correlation is significant at the 0.05 level

The Relationship between Coach's Support and Sports Success

Similarly, the results presented in **Table 5** demonstrate a statistically significant relationship between each dimension of the coach support variable and sports success ($p < 0.0001$). The strength of these correlations falls within the moderate to strong category, with coefficients ranging from r = 0.48* to r = 0.87*.

Table 5. Correlations between Coach's Support with Sports Success

Dimensional Variables		Perceived Available Support	Athletes' Received Support	Flow State	Attention	Technique	Sensitivity To Error	Commitment
Perceived available	Pearson Corr.	1	0.78*	0.87*	0.77*	0.85*	0.79*	0.71*
support	*p*-value	--	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Athletes' received	Pearson Corr.	0.78*	1	0.59*	0.59*	0.73*	0.59*	0.48*
support	*p*-value	< 0.0001	--	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Flow State	Pearson Corr.	0.87*	0.59*	1	0.73*	0.67*	0.61*	0.62*
	p-value	< 0.0001	< 0.0001	--	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Attention	Pearson Corr.	0.77*	0.59*	0.73*	1	0.72*	0.66*	0.61*
	p-value	< 0.0001	< 0.0001	< 0.0001	--	< 0.0001	< 0.0001	< 0.0001
Technique	Pearson Corr.	0.85*	0.73*	0.67*	0.72*	1	0.87*	0.67*
	p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	--	< 0.0001	< 0.0001
Sensitivity to error	Pearson Corr.	0.79*	0.59*	0.61*	0.66*	0.87*	1	0.72*
	p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	--	< 0.0001
Commitment	Pearson Corr.	0.71*	0.48*	0.62*	0.61*	0.67*	0.72*	1
	p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	--

2-tailed test of significance is used
*: Correlation is significant at the 0.05 level

Relationship between exercise habits and engagement

Meanwhile, we observed a significant relationship between each dimension of the exercise habits variable and engagement ($p < 0.0001$). The relationship between the exercise habits variable and engagement was in the moderate to large category, ranging from r = 0.45* to r = 0.92* (see **Figure 2**).

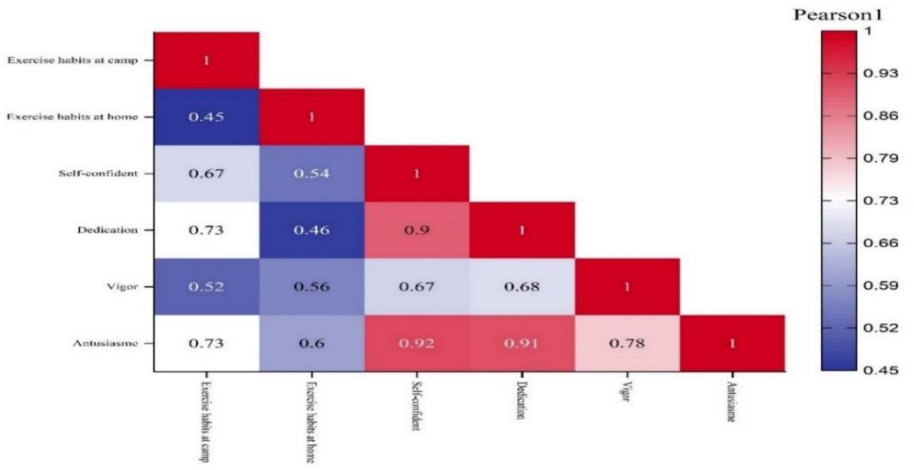

Figure 2. Heatmap Correlations between Exercise Habits with Engagement

Relationship between exercise habits and sports success

Meanwhile, the analysis revealed a statistically significant relationship between each dimension of the exercise habits variable and engagement ($p < 0.0001$). The strength of these correlations ranged from r = 0.45* to r = 0.92* (see **Figure 3**).

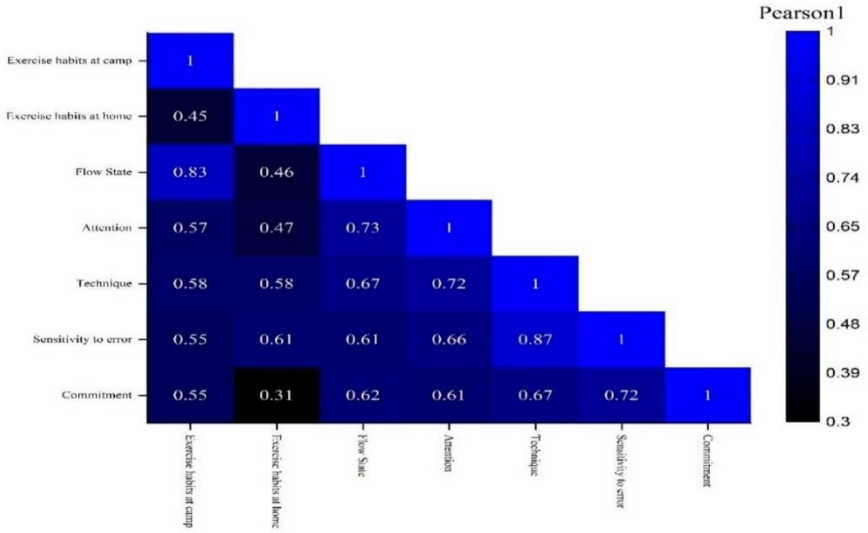

Figure 3. Heatmap Correlations between Exercise Habits with Sports Success

The research aims to investigate the relationship between each dimension of the coach's support, exercise habits, engagement and sports success variables among young table tennis athletes. Our initial finding confirms that there is a significant relationship between the coach support variable and both engagement and sports success. Given that previous studies examining the relationship between coach support and these two outcomes among young athletes remain limited, we present earlier research findings that closely align with our results. Hidayat et al. (2025) reported that providing verbal or behavioral support can serve as an effective strategy for coaches to enhance competitive performance among young athletes. Similarly, a previous study documented that supportive feedback has been recognized as influential in increasing training engagement, including in sports coaching contexts (Jiang et al., 2025). Fundamentally, feedback in the form of support has been widely used by coaches across various sports disciplines, including table tennis. This is largely because positive verbal support fosters harmonious interactions and relationships (Liu et al., 2025), cooperation, and mutual trust between coaches and athletes (Coussens et al., 2025). A prior study also reported that continuous support from coaches during competition sessions significantly boosts athletes' motivation and mental resilience to win matches (Ridwan et al., 2025). Two additional reports confirmed that autonomy-supportive coaching can significantly reduce burnout among athletes (Choi et al., 2020). Long-term training programs often trigger elevated stress levels among athletes; therefore, the presence of a coach who consistently provides positive support can serve as a remedy to alleviate stress and ultimately restore competitive performance (Simons & Bird, 2023). Furthermore, Sevil-Serrano et al. (2021) reported similar findings, showing that coach autonomy support is positively associated with key aspects such as motivation and commitment in football athletes. In line with these previous findings, we affirm that the coach support variable models a relationship with both engagement and sports success. This means that the more frequently coaches provide support during training or competition sessions, the greater the impact on athletes' engagement and sports success.

Our second key finding demonstrates that exercise habits are significantly associated with both engagement and sports success among young table tennis athletes. These results are consistent with and supported by several previous studies. In competitive sports, athletes are expected to adopt a range of behavioral habits, including adequate sleep (e.g., 8 hours per night), healthy dietary practices (e.g., avoiding junk food, high-calorie, and high-sugar intake) (AlKasasbeh & Akroush, 2024), and consistent training routines (e.g., three

sessions per week) (Laborde et al., 2020). Strong exercise habits are typically characterized by regular physical activity performed with consistent intensity and volume. Previous research has shown that regular exercise habits are closely linked to improved physical performance in adults (Landi et al., 2018). Within the context of this study, it is evident that exercise habits positively influence both engagement and sports success. This aligns with theoretical perspectives suggesting that habits must be performed repeatedly over time to become ingrained as permanent behaviors (Akbaruddin et al., 2025). Additionally, literature indicates that habitual behavior serves as a foundational mechanism for promoting sustained physical activity (Feil et al., 2021). In summary, the findings of this study clearly and accurately confirm that the exercise habits variable plays a significant role in enhancing both engagement and sports success among young table tennis athletes.

Strengths, Limitations and Suggestions Future Research

A key strength and unique contribution of this study lies in the development and revalidation of a tailored instrument designed to measure coach support, exercise habits, engagement, and sports success specifically among young table tennis athletes. However, a notable limitation is that the sample was restricted to athletes from a single sport, which limits the generalizability of the results to broader athletic populations. Future research is encouraged to address these limitations, for example adding participants from several types of sports such as tennis, badminton, volleyball or sepak takraw.

CONCLUSION

The findings of this study confirm a significant correlation between coach support, exercise habits, engagement, and sports success among young table tennis athletes. This research is expected to serve as a valuable reference for table tennis coaches, highlighting the importance of providing sustained support and cultivating strong exercise habits to promote continuous commitment in training and ultimately enhance competitive performance and sports success.

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CONFLICT OF INTEREST

The authors declare and confirm that there is no conflict of interest associated with this research.

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