

Original article

The relationship between resilience and cognitive emotion regulation with the performance of paintball players

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Abstract: The athlete's skills and psychological state often influence success in sports performance. The current study aims to explain the performance in paintball competitions based on cognitive resilience and cognitive regulation of emotion. The study participants included all paintball players participating in national paintball competitions (the year 2022), including 17 teams of 7 players, a total of 116 people. In order to investigate the psychological components affecting the athletes' performance, Conner-Davidson Resilience Scale (CD-RISC) and Cognitive Emotion Regulation Questionnaire (CERQ) were used. After completing these questionnaires, IBM SPSS Statistics version 26 was used to analyze the data. Pearson's correlation coefficient and stepwise regression were used to analyze the data. The results showed a significant relationship between resilience scores, the overall score of cognitive emotion regulation, and the scores of 9 emotion regulation strategies with the players' performance in the paintball competition ($P \leq 0.05$). Players who achieved better results in tournaments, scored higher on the resilience factor. Also, players who achieved better results in matches had higher scores on emotion regulation strategies like self-blame, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective, and lower scores on the acceptance, rumination, catastrophizing and other-blame strategies. This study showed that cognitive resilience and emotion regulation could be used as predictors of success and winning positions in paintball competitions.

Keywords: resilience; cognitive emotion regulation; paintball; sports success

1. Introduction

Optimal performance in sports is the result of a combination of technical (technical and tactical), physical (strength or speed), and mental (concentration, self-confidence, anxiety control) abilities [1]. Studies have shown that mental preparation has the most significant statistical link with Olympic ranking [2]. Mental preparation is essential for successful performance in most sports and can help all athletes to increase their performance, cope with the pressures of competition, recover from injury, continue their sports program and enjoy their sport [3]. Various psychological variables affect the performance of athletes, among them are cognitive resilience and cognitive regulation of emotion.

Cognitive resilience is considered as a measure of coping with stress and is vital in treating anxiety, depression, and stress reactions [4]. Resilience refers to positive adaptation or the ability to maintain or recover mental health, despite experiencing adversity [5]. Resilience is measurable, changeable, and improves with treatment [4]. One of the psychological factors related to sports success is the model of psychological resilience, which is a dynamic process of positive adaptation to bitter and unfortunate experiences, and since athletes face various stresses, such as competitive, organizational, and personal stress, resilience as a dynamic psychological process can protect athletes from many stressful factors [6]. High resilience characteristics are associated with coping strategies that may lead to more effective adaptation to challenges [7]. Psychological resilience is essential in sports because athletes must have a set of protective factors to resist the distinct stressors associated with a competition [8]. Hosseini and Besharat (2010) conducted a study to investigate the relationship between resilience, sports progress, and mental health in a sample of 139 athletes. The results showed that resilience has a positive relationship with sports progress and psychological well-being and a negative relationship with psychological distress. They concluded that resilience might be related to sports progress and mental health [9].

Another psychological component that can affect the success of paintball players is the cognitive regulation of emotion. Appropriate emotional responses are beneficial for an athlete and improve maximal strength, improve the quality of interaction with teammates, reduce the risk of losing self-control, reduce the risk of injury, and improve interpersonal and organizational dynamics [10]. Athletes and sports psychologists state that the ability to control emotions is vital to success. Cognitive regulation of emotion refers to the conscious and cognitive method of managing stimulating information [11], [12]. The intensity of emotions experienced in competition and the

effectiveness of emotion regulation strategies affect the athlete's performance and well-being, which may have implications for other sub-disciplines [10]. Athletes skilled in regulating emotions can better compensate for their negative emotional states [13]. Many thoughts and behaviors used by athletes to regulate emotions are helpful. For example, a cyclist who becomes aware of his muscles tightening up during a race may use a relaxation strategy or shift his attention away from the muscles, preventing him from becoming anxious or angry about the situation [10]. Maghsoudi et al. (2018) conducted a study to evaluate the relationship between cognitive emotion regulation strategies and coping styles with sports success in student-athletes and concluded that the relationship between cognitive emotion regulation and task-oriented coping style with sports success was significant and positive. They stated that the skill of cognitive regulation of emotions in athletes improves sports performance [13].

The current study aims to explain the performance in paintball competitions based on psychological indicators so that, finally, it can be determined to what extent predictor variables can explain the variance of success and position in paintball competitions. Therefore, the current study investigates the relationship between cognitive resilience and cognitive regulation of emotion with the performance of paintball players.

2. Materials and Methods

2.1. Participants

Participants were all paintball players participating in the national championship (the year 2022). The participants included 17 teams of 7 people, a total of 116. The operational definition of athletes' success was to place in the first to fourth team rank. The criteria for entering this study include being healthy in terms of skeletal, muscular, and nervous systems, the absence of any disease or dysfunction of the sensory and motor system, and having a history of at least five years of professional sports in paintball. Also, the exit criterion of this research was the unwillingness to complete the questionnaires (out of 119 participants, only three athletes from the same team refused to complete the questionnaires).

2.2. Instruments

This research used the Connor-Davidson Resilience Scale (CD-RISC) to investigate cognitive resilience. This questionnaire is a brief self-assessment measure of resilience with good psychometric properties. The Connor-Davidson Resilience Scale consists of 25 items, each rated on a 5-point scale (0-4), with higher scores indicating greater resilience and test scores ranging from 0 to 100 [4], [14]. Among several measures of resilience in general psychology,



researchers used only CD-RISC in sports. CD-RISC measures resources or personal characteristics deemed appropriate for positive adaptation to adversity [15].

In order to investigate the cognitive regulation of emotion, the Cognitive Emotion Regulation Questionnaire (CERQ) was used. This questionnaire measures nine cognitive strategies of emotion regulation. Each strategy has four questions, and this questionnaire has 36 questions. CERQ can be used to measure cognitive strategies that characterize a person's response to stressful events and to measure cognitive strategies used in a specific stressful event or situation, depending on the nature of the questions. CERQ is a self-report questionnaire that can be administered to people aged 12 and older because, from that age, people can have the cognitive abilities to comprehend the items [16]. This questionnaire includes nine distinct conceptual scales, each referring to what respondents think rather than what they do after experiencing threatening or stressful life events. These nine domains include self-blame, others-blame, acceptance, rumination, refocus on planning, positive refocusing, positive reappraisal, putting into perspective, and catastrophizing.

2.3. Procedure

The current research method is practical in terms of purpose. Because the current research focuses on the relationships between variables, it is descriptive by correlation. After obtaining the consent of the participants, the authors first explained the purpose

of the research to them, then gave them the questionnaires, providing the necessary guidance; they were asked to read the questions carefully before answering them. They were asked to choose the option that suited their characteristics and not to leave any questions unanswered as much as possible. Information was collected individually in the form of a team. Finally, all the participants answered the research questionnaires in pen and paper. Participants were told to refrain from writing their names and were assured that the information received from them would remain confidential and that those who did not want to answer these questions may stop their cooperation at any stage of study.

2.4. Analysis

After completing the questionnaires, IBM SPSS Statistics version 26 software was used to analyze the data. From the indicators of descriptive statistics; frequency, average, percentage, and standard deviation and inferential statistics methods; Pearson's correlation coefficient and stepwise regression were used.

3. Results

The average age of the subjects was 30.46 years, average height was 176.54 cm and average weight was 75.70 kg. The average age, weight and height of the participants based on their team rankings are shown in figure 1. Also average scores of resilience and cognitive emotion regulation of the participants are shown in figure 2 and figure 3.



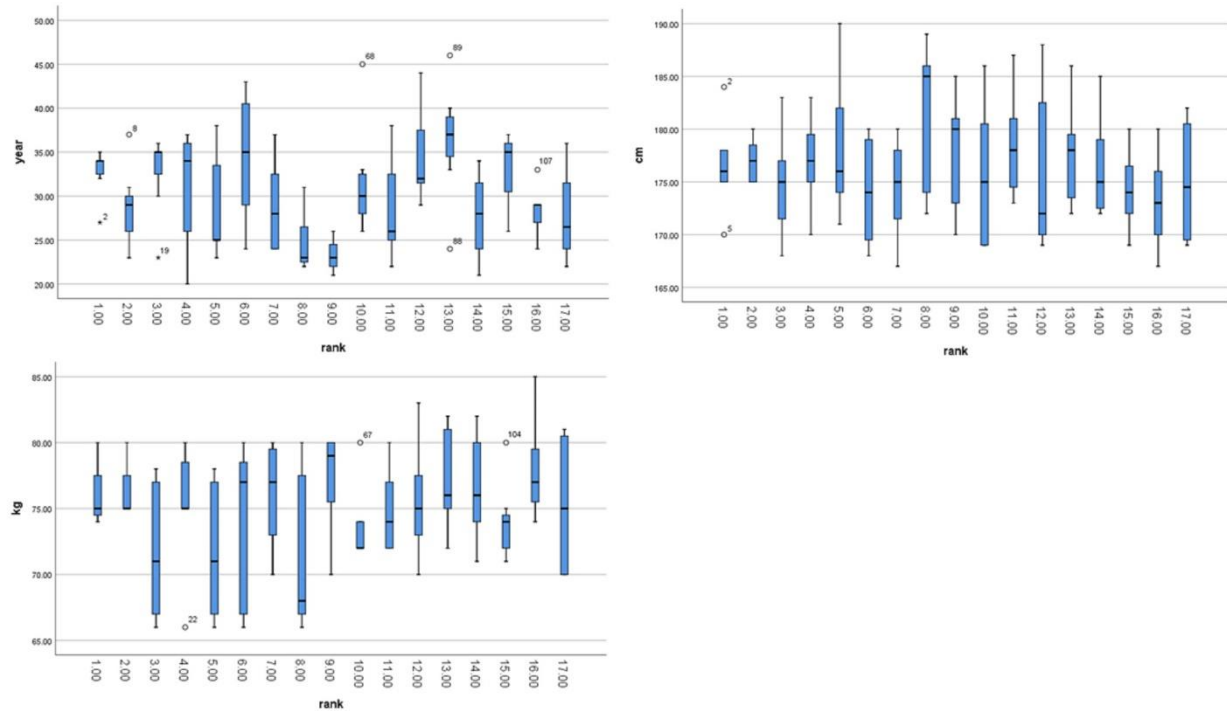


Figure 1. Comparison of the average age, height and weight of participating athletes based on the rank obtained in paintball competitions

In order to check and use inferential statistics, the research assumptions should be controlled first, and one of these assumptions was to check the natural distribution of the data. The results of the Kolmogorov-Smirnov test showed that the data distribution of psychological factors and the success

of athletes was normal ($P < 0.05$). for this reason, to investigate the role of psychological factors on the success of paintball athletes, the Pearson correlation coefficient was used at a significance level of $P \leq 0.05$.

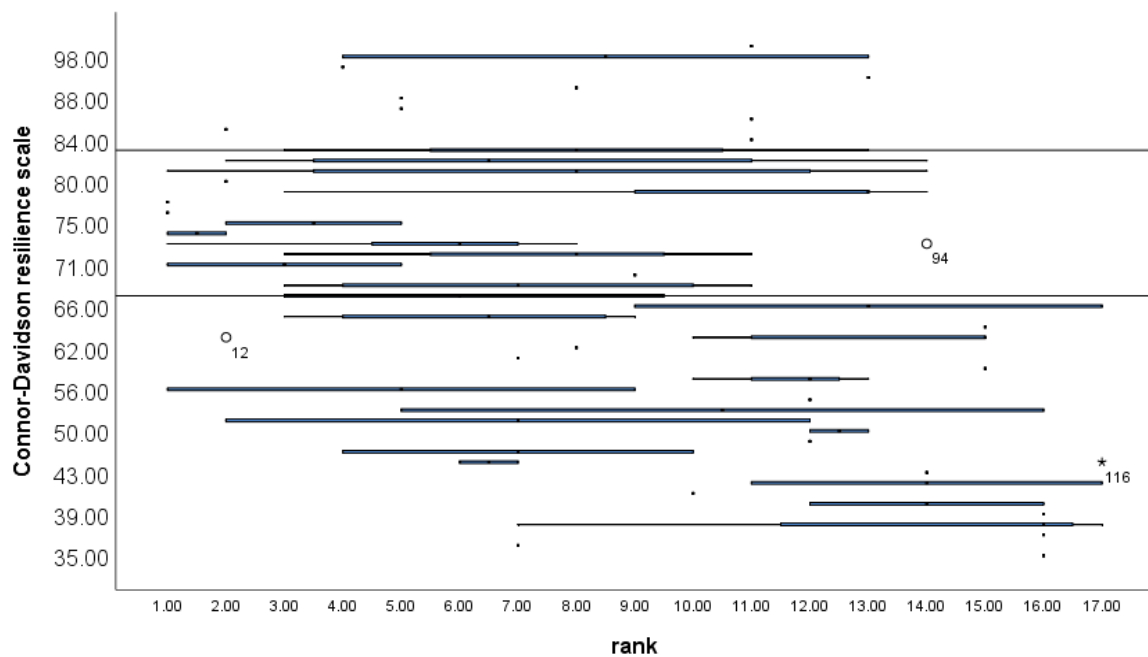


Figure 2. Comparison of average score of cognitive resilience of participating athletes based on the rank obtained in paintball competitions



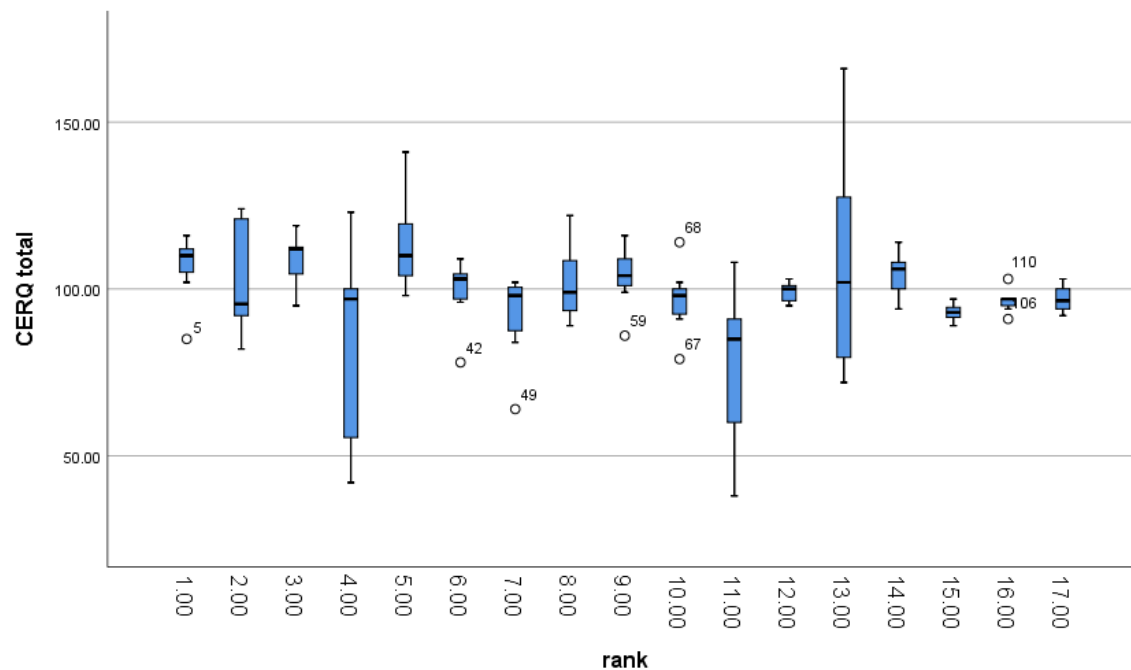


Figure 3. Comparison of average score of cognitive emotion regulation (total score) of participating athletes based on the rank obtained in paintball competitions

According to the result of Pearson's correlation coefficient test (Table 1), some of these variables had a negative correlation, and some had a positive correlation with sports success. The most vigorous intensity of correlation was related to the other-blame strategy (-0.566). In the factors of cognitive resilience, cognitive regulation of emotion (total scores of 9 strategies), self-blame, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective with sports success, the

correlation was positive; That is, by increasing the value of the variable, the success of paintball athletes increases and vice versa. On the other hand, in the psychological factors of acceptance, rumination, catastrophizing, and other-blame, the correlation was negative; That is, by increasing the value of the variable, the success of paintball athletes decreases and vice versa. Also, the relationship between all variables with sports success was significant.

Table 1. General results of Pearson's correlation test between psychological factors and the success of paintball athletes

Variable	P-value*	Correlation coefficient
Cognitive resilience	0.001	0.356
Cognitive emotion regulation (total score)	0.006	0.258
Self-blame	0.005	0.266
Acceptance	0.001	-0.308
Rumination	0.005	-0.264
Positive refocusing	0.001	0.477
Refocus on planning	0.001	0.470
Positive reappraisal	0.001	0.388
Putting into perspective	0.001	0.517
Catastrophizing	0.001	-0.487
Other-blame	0.001	-0.566

*Significance level=0.05

The results of Table 2 show that the factor of cognitive emotion regulation (total score), rumination, refocus on planning, positive reappraisal, catastrophizing, and other-blame can predict sports success, and the t-test for the

significance of their regression coefficients is significant at the level of 0.05. According to the obtained results ($R^2=0.46$, $F=7.96$, $P=0.05$), it can be said that the variables of cognitive emotion regulation (total score), rumination, refocus on



planning, positive reappraisal, Catastrophizing, and other-blame, explained 46% of the variance in athletes' success. Also, the standardized coefficients (β) show that the factor of cognitive regulation of

emotion (total score), positive reappraisal, other-blame is more effective than rumination, refocusing on planning and catastrophizing in predicting athletes' success.

Table 2. Regression results to predict success based on research variables

	B	Standard error	Beta	t	P-value
(constant)	7.081	3.402		2.081	0.040
Cognitive resilience	0.000	0.029	0.001	0.006	0.995
Cognitive emotion regulation	-0.550	0.268	-1.980	-2.052	0.043
Self-blame	0.547	0.306	0.380	1.788	0.077
Acceptance	0.621	0.318	0.374	1.953	0.054
Rumination	0.892	0.379	0.481	2.354	0.021
Positive refocusing	0.470	0.448	0.387	1.049	0.297
Refocus on planning	-0.513	0.094	-0.463	-5.474	0.000
Positive reappraisal	1.160	0.448	1.037	2.592	0.011
Putting into perspective	0.133	0.314	0.110	0.424	0.673
Catastrophizing	0.586	0.294	0.482	1.991	0.049
Other-blame	0.844	0.307	0.908	2.748	0.007

4. Discussion

The present study was conducted to explain the performance in paintball competitions based on psychological indicators and sought to determine how much cognitive resilience and cognitive regulation of emotion as predictor variables can explain the variance of success and winning positions in paintball competitions. The relationship between the factor of cognitive resilience with sports success and gaining a position as a paintball player is one of the hypotheses of the present research. There was a significant relationship between the resilience score and their performance in the paintball competition. Therefore, by increasing the players' resilience, the sports performance increases, and the players get a better position in the competitions. Westmattelman et al.'s (2021) study aimed to compare resilience in professional athletes, students, and employees in the workplace. The results showed that professional athletes have a higher level of resilience. It was also shown that the resilience scale has a positive role in continuing professional sports activities in elite athletes, but it is ineffective in predicting their success in competitions. The reason why the results of this research are not in line with the hypothesis of our research is probably that in the study of Westmattelman et al., sports success was investigated only in super-professional athletes and world medal holders. Athletes with that skill level have high resilience and have little difference between their scores. Therefore, the role of other influential factors in sports success becomes more prominent. In the study of Secades et al. (2016), the relationship between resilience and coping strategies was investigated in athletes of different sports fields.

The results showed that people with higher resilience get higher scores in more adaptive coping strategies, such as task-oriented coping, which can affect their sports success. The study of Hosseini and Besharat (2010) was conducted to investigate the relationship between resilience and sports progress and mental health (with the help of the CD-RISC questionnaire), and the results showed that resilience has a positive relationship with sports progress and psychological well-being and a negative relationship with distress. The results of these two studies were consistent with the hypothesis of the present study [7], [9], [17]. Therefore, it can be concluded that the resilience factor is related to sports performance and predicts success in paintball competition in non-professional athletes.

In further analysis, the cognitive regulation of emotion was investigated with nine specific sub-factors separately. These nine strategies are generally divided into two categories: adaptive strategies (acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective) and maladaptive strategies (self-blame, other-blame, catastrophizing, and rumination). According to the results; self-blame, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective were positively correlated with sports success, i.e., top teams scored higher in these factors. On the other hand, the players of the top teams showed a lower score in factors of acceptance, rumination, catastrophizing, and blaming others; all these results were statistically significant ($P \leq 0.05$). In the study of Maghsoudi et al. (2018), the only strategy that could positively predict sports success was refocus on planning. The study of Keshavarz et al. (2015) was conducted with the aim of comparing nine strategies of cognitive



emotion regulation questionnaire in amateur and semi-professional athletes, and according to the results, semi-professional athletes scored higher than amateur athletes in refocus on planning and acceptance. Amateur athletes scored higher in other-blame. The study by Horvath et al. (2022) showed a positive correlation between the destruction of concentration and cognitive anxiety of athletes using maladaptive emotion regulation strategies (other-blame, self-blame, rumination, and catastrophizing). Therefore, it can be said that using maladaptive strategies not only does not have a positive effect on the success of athletes but also reduce the chance of success by being accompanied by stress and lack of concentration [13], [18], [19]. The results of the present study showed that successful players tend to use more adaptive strategies, which is in line with the body of literature. Also, the overall CERQ score indicates the use of any emotion regulation strategy, and in this study, the top teams obtained higher scores, which indicates that the top players were more inclined to use any emotion regulation strategy.

5. Conclusions

In the present study, the relationship between the psychological factors of resilience, and cognitive regulation of emotion with the success of paintball players in competitions was investigated. It can be concluded that the players who had higher resilience, obtained better results in the matches. Also, top players were more inclined to use emotion regulation strategies, especially adaptive strategies.

Limitations: A critical limitation of the present study is that the performance of the athletes was not assessed individually. Although the psychological traits of the athletes were assessed independently using questionnaires, the investigators were not equipped to evaluate the athletic performance of each athlete separately since in paintball, only team performance is usually evaluated. Therefore, investigators are suggested to consider this limitation in generalizing the results.

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Conflicts of Interest: The authors declare no conflict of interest.

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ارتباط بین تاب آوری شناختی و تنظیم شناختی هیجان با عملکرد بازیکنان پینت بال

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چکیده: موفقیت در عملکرد ورزشی اغلب تحت تاثیر مهارت‌ها و حالت‌های روانشناختی ورزشکار است. هدف پژوهش حاضر، توصیف عملکرد بازیکنان پینت بال بر اساس تاب آوری و تنظیم شناختی هیجان است. جامعه آماری این پژوهش شامل تمامی بازیکنان پینت بال شرکت کننده در مسابقات کشوری پینت بال بود. تعداد کل نمونه تحقیق شامل ۱۷ تیم ۷ نفره و در مجموع ۱۱۶ نفر بود. به منظور بررسی مؤلفه‌های روانشناختی موثر بر عملکرد ورزشکاران از دو پرسشنامه‌ی مقیاس تاب آوری کانر-دیویدسون (CD-RISC) و تنظیم شناختی هیجان (CERQ) استفاده شد. جهت تجزیه و تحلیل داده‌ها از روش ضریب همبستگی پیرسون و رگرسیون گام به گام استفاده شد. نتایج نشان داد که ارتباط معناداری بین نمرات تاب آوری، نمره‌ی کلی تنظیم شناختی هیجان و نمرات ۹ راهبرد تنظیم هیجان با عملکرد بازیکنان در رقابت پینت بال وجود دارد ($P \leq 0/05$). بازیکنانی که نتایج بهتری را در مسابقات کسب کردند، نمرات بالاتری در فاکتور تاب آوری کسب کردند. همچنین بازیکنان برتر، نمرات بالاتری در راهبردهای سرزنش خود، تمرکز مجدد مثبت، تمرکز مجدد بر برنامه‌ریزی، ارزیابی مجدد مثبت و در چشم انداز قراردادن و نمرات پایین تری در راهبردهای پذیرش، نشخوار فکری، فاجعه سازی و سرزنش دیگران کسب کردند. نتایج این پژوهش نشان داد که تاب آوری شناختی و تنظیم شناختی هیجان می تواند به عنوان متغیرهای پیش بین موفقیت و کسب مقام در مسابقات پینت بال مورد استفاده قرار گیرد.

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این نماد به معنای مجوز استفاده از اثر با دو شرط است یکی استناد به نویسنده و دیگری استفاده برای مقاصد غیر تجاری.

واژه‌های کلیدی: تاب آوری؛ تنظیم شناختی هیجان؛ پینت بال؛ موفقیت ورزشی