Contribution of emotional intelligence to Taekwondo athlete's performance

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Abstract:

Emotional intelligence in sport and physical exercise was the focus of this study. Before contemplating the actual practice in the form of emotional intelligence training, we conducted a thorough evaluation of the current research and provide here a sound theoretical integration of several emotional intelligence viewpoints. Sport is an environment in which people must push themselves to work hard to attain long-term goals. Athletes must also cope with the stress of intense training and competitive pressure on a consistent basis, which entails recognizing and controlling their own emotions and those of others (e.g. teammates, opponents, coaches, referees and spectators). In total, there were 349 fully answered questionnaires (N = 349). A total of 46.4% (N = 162) of the interviewed athletes participated in all three official events during the 2018–2019 competition year. We investigated the relationships between sports performance and emotional intelligence. This study shows that high emotional intelligence scores are associated with more effective sports performance. In addition, significant correlations were observed between cognitive and somatic state anxiety, and negative correlations were observed between cognitive and somatic anxiety and self-confidence. Moreover, comparisons between groups were made using the Structural Equation Model (SEM), and correlations between variables were analysed using the Spearman correlation. The reliability analysis showed that all scales had a reliability coefficient of over 0.6. Confirmatory factor analysis (CFA) showed that the proposed model for the structure of the tool was satisfactory (normed $\chi^2 < 1$, Root Mean Square Error (RMSE) < 0.1 and CFI > 0.9). We determined that emotional intelligence was affected by negative thinking, automaticity, goal setting and emotion control. Thus, the development of these psychological elements may help athletes avoid worrying and increase their performance.

Key words: Motivation, Confidence, Automaticity, Anxiety, Training

Introduction

This study aimed to determine how practical emotional intelligence training helps reduce the pervasive pressure on taekwondo athletes. Approximately 50–90% of sports psychologists and athletes recognize the effect of psychological influences on achievement. Athletes dedicate a considerable amount of time to learning the mental skills that allow them to be mentally fit. Success in sports competitions is essential to athletes (Jones G, Hanton et al., 2007). Many coaches believe that this is a critical aspect. Sports influence general behaviour, cognition and emotions. In addition, studies typically focus on reaching, reacting and assessing beyond the expectations and the stability of meeting goals, both positive and negative. One of the essential factors in sports performance is mental readiness as well as the rate of growth of this trait and other influential factors. Emotional intelligence preparation is one of the most effective ways to improve anger-processing abilities. Improving emotion management capabilities through schooling is one way to grow emotional readiness. Regarding the motivation of emotional intelligence, Strigas (2003) investigated what motivated young college students to volunteer for a sport event; this study may help organizations to convincingly appeal to this free labour during recruitment. Recently, Khimenes et al. (2016) determined that the structure of physical preparedness of orienteers significantly varied depending on sports qualifications. Furthermore, taekwondo is a sport in which athletes must regularly control their weight to perform in their weight group. Weight-loss methods differ, frequently at the cost of dietary wellbeing and athletic performance (Fleming and Costarelli, 2009). Moreover, Popovych et al. (2019) performed content analysis of footballers' replies and determined that the mental state of expecting a victory during key matches was a complicated phenomenon. The qualitative interpretation of the mental states of anticipating a win, distinguishing one state from another and defining the features of the mental states of expecting a victory were all possible thanks to content analysis. Furthermore, the talent development environment is linked to athletes' goal orientation, motivation, and other essential psychological traits (Andronikos et al., 2021). Recent research on male taekwondo athletes has determined that their diet, both on a regular basis and prior to competition, can affect their success as well as their short- and long-term health (Fleming and Costarelli 2007). Emotional intelligence is described as the capacity to reason correctly about emotions and to use emotions and emotional awareness to develop one's thinking (Mayer et al. 2008). Emotional

intelligence was previously described (Mayer and Salovey 1997) as the capacity to correctly interpret, appraise, and convey emotion, as well as access and produce emotions as they promote thinking. Increased emotional maturity, according to Akerjordet & Severinsson (2007), leads to more positive behaviours, better relationships, a stronger orientation toward positive ideals and greater adaptability. Stavropoulos et al. (2012) explored the key competencies that good track and field coaches should have, such as field management strategies, sport science, biology, injury prevention/risk management, and field conditioning, to determine the needed competencies for Greek track and field coaches. In addition, Papailiou et al. (2015) determined that every coach may have his/her own way to achieve effectiveness, and the focus on coaching performance evaluation may shift from how a coach is effective to when. Robust approaches of coaching performance evaluation accept the team's and athlete's outcomes as the only objective, measurable and available criteria. Furthermore, Strykalenko et al. (2020) investigated that the correlation between the efficiency of the performing competitive activities and the intellectual qualities displayed by the other positions is minor. Researchers have recognized that assessments of sport anxiety taken into account cognitive anxiety (negative feelings, and worry) as well as somatic anxiety (physiological response) in recent decades (Terry and Slade, 1995). Furthermore, because anxiety is one of the most contentious psychological subjects, many sport psychologists have measured it. It is described as a negative emotional state characterized by feelings of nervousness, concern and apprehension that are linked to the stimulation or arousal of the body. Furthermore, Spielberger (1966) contrasted between state and feature fear. State anxiety is a transient, ever-changing mental state marked by subjective, consciously experienced sensations of fear and stress brought on by the stimulation of the autonomous nervous system. Trait fear, however, is a behavioural tendency to view objectively non-dangerous situations as risky, resulting in disproportionate amounts of state anxiety. Martens et al. (1990) proposed a two-dimensional model of cognitive anxiety, somatic anxiety, self-confidence and performance. They define competitive anxiety as conscious feelings of apprehension and tension due mainly to the athlete's perception of the presence of upcoming situations as threatening. Most athletes face anxiety as a negative emotion because it can worsen performance (Duda, 1998). The Competitive State Anxiety Inventory (CSAI-2) considers the difference between anxiety state (i.e. momentary anxiety) and anxiety trait (i.e. chronic anxiety) and distinguishes between cognitive and somatic anxiety (Smith et al., 2006). The CSAI-2 verified the effects of anxiety in novice karate performers on the visual search strategy, changing their peripheral narrowing or increasing susceptibility to peripheral distractors in response to taped offensive karate sequences. In another quantitative study, Zizzi et al. (2003) examined the relationship between emotional intelligence and sports performance among Division I college baseball players. They determined that certain aspects of emotional intelligence were moderately related to pitching performance but not hitting performance (Zizzi et al., 2003). However, Ntasis (2019) looked at predictive approaches to help teams make better decisions during games based on previously collected data from athletes. To our experience, the mental maturity of Greek taekwondo athletes has not been extensively investigated. The aim of this study was to look at the anxiety and personal feelings of taekwondo athletes.

Material & Methods

According to the literature, the proposed model (Figure 1) shows the suggested interactions. All the hypothesized variables are displayed in the above-mentioned model, which critically investigates the following hypotheses:

- H₁: Cognitive anxiety positively influences negative thinking*
- H₂: Somatic anxiety positively influences negative thinking*
- H₃: Self-confidence positively influences automaticity and goal setting*
- H₄: Emotional control positively and directly influence emotional intelligence*
- H₅: Negative thinking negatively influences emotional intelligence*
- H₆: Automaticity positively influences emotional intelligence*
- H₇: Goal setting positively influences emotional intelligence*
- H₈: Emotional control positively influences emotional intelligence*

Figure 1: The proposed model

The survey questions were designed based on the methods employed by previous emotional intelligence and anxiety researchers (e.g., Cox, R. H et al., 2003; Lane, A. M, et al., 2004; Schutte, N. S, 1998). Different existing scales were used to help define the measurement under each variable sub-dimensions. The research method we carried out was in the form of sampling active taekwondo athletes throughout Greece. Totally answered questionnaires included N = 349. In addition, 46.4% (N = 162) of the interviewed athletes participated in all three official events during the 2018–2019 competition year to count their performance in their personal competitions. In the descriptive statistics, 46% of the sample was females, and 54% was males with an average age of 26. The present analysis is a fundamental element of the study with the main parameter linking emotional intelligence with athletes' effectiveness. Data were analysed by means of the Statistical Package for Social Science (SPSS) and SPSS Amos.

Table 1: Comparison of emotional intelligence with performance in competitions

<i>Winning Matches</i>	<i>Average Emotional Intelligent (Likert scale)</i>	<i>N</i>	<i>Standard Deviation</i>	<i>F</i>	<i>Sig</i>
<i>Less than 6</i>	<i>2.5–2.8</i>	<i>11</i>	<i>0.4252</i>	<i>32.942</i>	<i>0.000</i>
<i>7</i>	<i>2.9–3.0</i>	<i>35</i>	<i>0.4511</i>	<i>145.178</i>	<i>0.000</i>
<i>8</i>	<i>3.1–3.3</i>	<i>33</i>	<i>0.4481</i>	<i>6.956</i>	<i>0.010</i>
<i>9</i>	<i>3.5–3.7</i>	<i>28</i>	<i>0.4875</i>	<i>6.884</i>	<i>0.010</i>
<i>10</i>	<i>3.8–4.0</i>	<i>27</i>	<i>0.4399</i>	<i>125.843</i>	<i>0.000</i>
<i>11</i>	<i>4.1–4.2</i>	<i>22</i>	<i>0.4593</i>	<i>212.841</i>	<i>0.000</i>
<i>12</i>	<i>4.3–4.4</i>	<i>4</i>	<i>0.2857</i>	<i>2.408</i>	<i>0.001</i>
<i>13+</i>	<i>4.5–5.0</i>	<i>2</i>	<i>0.1549</i>	<i>2085.238</i>	<i>0.000</i>

F denotes the *F* statistic used with ANOVA, and *Sig* is the significance level.

Exploratory factor analysis (EFA), reliability analysis and anti-image correlation were performed to investigate the factorial structure of each scale. Data is suitable for factor analysis when the Kaiser–Meyer–Olkin (KMO) and the Bartlett sphericity tests are acceptable. In the KMO analysis, the index ranged from 0 to 1 with values above 0.70 considered satisfactory for factor analysis (Delen, D., Kuzey, C., & Uyar, A. 2013). In addition, the Bartlett sphericity test is significant at the 5% significance level. Moreover, rotation of axes was performed using the Varimax method based on the correlation between the variables. The criteria that were used to choose the number of factors and the items corresponding to each factor: eigenvalues were related to eigenvalues better than one for each factor and the factor loading of each item in the corresponding factor was over 0.6. Additionally, values above 0.7 were considered acceptable for the Cronbach α coefficient.

Furthermore, validation analysis was performed using confirmatory factor analysis (CFA). CFA is a special statistical method of structural data processing that is used to determine the Goodness of Fit Index (GFI) between the factorially structured model. It is an important tool in the second stage of an investigation and has been used in our study using the proposed exploratory model. The rejection or acceptance of a model is based on two types of control: 1) the global fit indices and 2) the magnitude of the variance explained by the resulting factors. The general indicators of good adaptation studied included the index χ^2 , Root Mean Square Error (RMSE) and Comparative Fit Index (CFI). Accepted results included χ^2 (x2df) degrees of freedom with ratio <2.0 , RMSEA <0.1 and CFI >0.90 (Schumacker & Lomax, 2012), where an acceptable adaptation was shown.

Results

Explanatory factor analysis showed that seventeen questions of the Anxiety Scale, which have factor loadings, varied from 0.611 to 0.842, which was accepted for our sample size (Cox, R. H et al., 2003). Moreover, EFA analysis showed that twelve questions in the Performance Scale (Table B) have a factor explanation for 23.9% of the data's variability. The factor loadings varied from 0.695 to 0.813, which was accepted for our sample size (Lane, A. M et al., 2004). Finally, eleven questions of the Emotional Intelligence Scale explained 16.29% of the data's variability, while the factor loadings for three times were between 0.708 and 0.857 (Schutte, N. S et al., 1998). The reliability analysis showed that all scales had a reliability coefficient of over 0.6. The confirmatory factor analysis (CFA) showed that the proposed model for the structure of the tool was satisfactory (Normed $\chi^2 < 1$, RMSEA < 0.1 and CFI > 0.9). The results indicate that the proposed scales had satisfactory validity and reliability indexes.

Structure equation model (SEM) analysis was used to investigate the hypotheses of H1-H8. Results are presented in Table 2 and showed that negative thinking was affected significantly by cognitive anxiety with $b = 0.181$, $p < 0.001$ and somatic anxiety with $b = 0.380$, $p < 0.001$. Self-confidence affected significantly the automaticity with $b = 0.208$, $p < 0.001$ and goal setting with $b = 0.540$, $p < 0.001$. Finally, emotional intelligence was affected significantly by emotional control with $b = 0.792$, $p < 0.001$, negative thinking with $b = -0.364$, $p <$

0.001, automaticity with $b = 0.398$, $p < 0.001$ and goal setting with $b = 0.172$, $p < 0.001$. These findings confirm the adherence of the fans to the sporting market industries. The criteria of best fit were confirmed based on the results (normed $\chi^2 = 19.4$, CFI = 0.911, RMSEA = 0.039).

Table 2: Structural Equation Model

			Estimate	S.E.	C.R.	P	Label
Negative thinking	< ---	Cognitive Anxiety	.181	.033	5.788	***	S
Negative thinking	< ---	Somatic Anxiety	.380	.026	13.810	***	S
Automaticity	< ---	Self Confidence	.208	.044	2.245	***	S
Goal-setting	< ---	Self Confidence	.540	.010	3.115	***	S
Emotional Intelligence	< ---	Emotional control	.792	.023	18.951	***	S
Emotional Intelligence	< ---	Negative thinking	-.364	.030	-2.078	***	S
Emotional Intelligence	< ---	Automaticity	.398	.007	.531	***	S
Emotional Intelligence	< ---	Goal-setting	.172	.020	9.516	***	S

S = Supported, R = Rejected, SE = Standard Error, CFI = 0.911, Normed $\chi^2 = 19.4$, RMSEA = 0.039

Discussion

Emotional intelligence is related to self-efficacy perceptions and assumptions about one's ability to control emotions. For example, if a person feels that being in a positive emotional state, such as being energetic and happy, will aid in achieving optimum results, the person will measure how they are actually feeling in relation to the ideal emotional profile. When a person finds a disparity between their current emotional state and their ideal emotional state, they begin a regulatory attempt to adjust their emotions to their desired levels. Once an individual's emotions have been balanced to an optimum degree for the task, emotional intelligence is proposed to aid in the maintenance of these emotions as well as task demands, and the desire to accomplish goals remain unchanged. Individual abilities to recognize and control emotions to acceptable levels is predicated on a degree of consistency in actual and ideal emotional states.

Given the essence of emotional intelligence, it is natural to ask if participants with poor emotional intelligence present reliable data, i.e. the accuracy of emotions remembered from memory and real emotions may be higher in emotionally intelligent individuals. To fix this potential flaw, we propose that future studies look at how emotional intelligence influences the test-retest reliability of real and remembered emotions. Moreover, memories of emotions correlated with optimum and unstable results, and according to Baumeister et al. (2007), offer a valuable source of knowledge about the generation of potential emotions as well as cognitions around these emotions. In addition, emotion has an indirect impact on success when people partake in activities to pursue or suppress expected emotional outcomes. If this claim is right, people with low emotional intelligence who associate negative emotions with bad results will develop low expectations about their ability to control these emotions. Low emotional intelligence, in this situation, is the result of repeated unsuccessful efforts to control emotions.

Conclusion

This research illuminated the role of trait emotional intelligence in the taekwondo sport while an athlete is under stress, and it contributes to the physiological evidence for the emotional control trait. Goal setting and personal pressure are important reasons for athletes to achieve high levels of success, and because emotional intelligence influences the stress response, athletes may be interested in whether it is possible to improve emotional intelligence, which may affect how they physically respond to a stressor. As a result, the effect of emotional intelligence on cognition through autonomous machine behaviour during a stressful event may be a fascinating subject for future study. Moreover, the problems and disadvantages of goal setting and emotional intelligence management in taekwondo colleges and universities are obvious, which is not conducive to cultivating the interests of contemporary college students to learn taekwondo.

To improve the emotional intelligence effect on taekwondo athletes, based on the proposed model, this study used a structural equation model to identify and minimize anxiety. To verify the performance of the model in this study, we set up control experiments and mathematical-statistical methods to verify the performance of the model. The research results showed that the model proposed in this study identified a certain effect of emotional intelligence and can be applied to teaching practice.

Conflicts of interest: The authors have no conflicts of interest to declare.

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