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ORIGINAL

OPTIMISATION STRATEGIES AND EFFECTIVENESS ASSESSMENT OF PSYCHOLOGICAL QUALITY DEVELOPMENT IN PERFORMANCE ENHANCEMENT OF ATHLETES

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ABSTRACT

This paper focuses on the main psychological quality indicators affecting athletes' performance, and on this basis, studies the relationship between athletes' main psychological qualities and sports performance. The purpose is to further evaluate and optimise the effect of psychological quality training in athletes' performance enhancement. Therefore, this paper takes the theory and application of mental health quality as the background, takes the relationship between sports and athletes' mental health quality as the entry point, and carries out a step-by-step research with both exploratory and validation. The study aims to promote the theoretical development of the research on athletes' mental health quality, enrich the theory of sports to promote the development of athletes' mental health, and provide reference and support for the practice of cultivating mental health quality in quality education. Firstly, with "what is mental health quality" as the keyword, the questionnaire, interview and mathematical statistics were used to compile and test the Questionnaire on Mental Health Quality of Athletes. Secondly, based on the theory of the relationship between sports and mental health quality, with the keyword of "how sports affect mental health quality", we select appropriate psychological, physiological and social indicators, and choose a number of athletes as the sample to explore the relationship between sports and mental health quality by questionnaire survey and mathematical statistics. and its mediating effect model. In order to clarify and optimise the effect of psychological quality training in athletes' performance enhancement, and to provide reference basis for research in related fields.

KEYWORDS: Psychological Quality Development; Effectiveness Assessment; Optimisation Strategy; Performance Enhancement; Athletes

1. INTRODUCTION

Athletes achieve excellent results in competition is the result of the combined effect of good quality, technology, tactics and psychological qualities (Yao Ouyang, Cai, & Wang, 2024; Weakley, Halson, & Mujika, 2022). With the rapid development of the technical level of modern competitive sports, sports competition is becoming more and more intense, and the achievement of excellent results often depends on the strength of the mobilisation of psychological ability. People are more and more aware that modern sports competition is not only the competition of athletes' physical ability and technical and tactical level, but also more importantly, the competition of psychological quality. Therefore, it is of great significance to study the influence of psychological quality on athletes' performance. Psychological factors include psychological quality, emotional experience, mental skills, intelligence, personality and competition mentality, among which in the components of psychological quality, the main elements include the athlete's anxiety, willpower quality, attention, self-confidence, adaptability and psychological stability, among which the athlete's anxiety, willpower quality and attention are also more important (Casagrande, Favieri, Tambelli, & Forte, 2020).

The so-called competition anxiety (Ong & Chua, 2021) refers to the tendency of athletes to be anxious about current or anticipated potentially threatening situations during training and competition. Athletes' psychological state, pre-competition, in-competition and post-competition emotional changes and their regulation, and the achievement of the best results are all related to anxiety. In 1982, Martens put forward the multidimensional anxiety theory, which divided competition anxiety into three aspects: cognitive state anxiety, somatic state anxiety, and state self-confidence. Cognitive state anxiety is the subjective perception of some kind of danger or threatening situation that exists immediately before or after the competition and generates worry (Kalia, Knauft, & Hayatbini, 2020). It is a negative evaluation of oneself or negative expectations of the results of the competition caused by anxiety, mainly to worry about failure, negative thoughts, as well as unpleasant visual imagery (Hua & Wang, 2023) as a feature; somatic state anxiety is the immediate presence of the autonomic nervous system during or before and after the competition or the activation of the state of arousal of the emotional experience. It is anxiety caused directly by the degree of arousal of the autonomic nervous system, which is manifested by increased heart rate, shortness of breath, lack of mental clarity, or muscular tension; state self-confidence refers to the beliefs that athletes have about the success of their own athletic behaviours during or before and after a competition. It is mainly determined by the psychological characteristics and the usual training conditions, the effect of the field, the

opponent's strength and weakness and their own personality characteristics, through their own internal mental activity state manifested in external behaviour. According to Martens' theory, the nature of each of the three dimensions and their respective patterns of change over time can be interpreted differently with respect to the relationship between each dimension and operant activity. First, since cognitive anxiety is characterized by shifting one's attention from task-relevant cues to task-irrelevant cues and social appraisals, when cognitive anxiety increases, the level of operant activity decreases accordingly, and there should be a linear relationship between the two. Second, previous studies have found that self-confidence increases when positive expectations of success increase, and positive expectations of success have a significant effect on the activity itself, so as self-confidence increases, the level of operant activity increases, and there should be a linear relationship between the two. Thirdly, somatic anxiety, which is predominantly a physiological trait, has an inverted relationship with the activity itself. Because the multidimensional anxiety theory reveals the body of race anxiety connotations and has standardized measurement tools, it has been widely adopted by a wide range of researchers and research results have proliferated. Many studies have shown that anxiety does have different prior variables, different time-varying characteristics, different operational outcomes, and also different responses to different interventions. It is thus clear that the phenomenon of competition anxiety affects competition not only in terms of its impact on the sport itself, but also in terms of its content on the physical and mental development of athletes. In general, negative anxiety is negatively correlated with performance, whereas positive anxiety is inversely correlated with sport performance. In other words, a moderate level of anxiety is most effective for motor skill acquisition or performance, while a high level of anxiety is a guarantee for the successful completion of gross or simple motor tasks, and a low level of anxiety is appropriate for delicate or complex tasks. However, it is a proven fact that regardless of motor skill, performance is highest when anxiety levels are moderate or optimal (Cao, 2022; La Fratta et al., 2021).

Willpower is the mental process of consciously determining, regulating actions and overcoming difficulties to achieve a purpose. The content of willpower quality includes the purposefulness of firm willpower quality, tenacity of willpower quality, initiative and self-control of willpower quality. The so-called firm will quality of purpose is that athletes in training and competition, not only have a clear purpose, but also strive to achieve the goal. The so-called tenacity of the quality of will is to require athletes to have the tenacity to suffer and endure great hardship and to be able to persevere, no matter whether they are participating in competitions or in daily training (Tesema & Drieling, 2020). The initiative of will quality is to educate athletes should have a strong desire to create excellent results. Self-control ability is to educate and cultivate athletes to be able to control their own emotions and actions, to grasp the appropriate intensity of training and competition, and to effectively regulate the unbalanced

psychological state brought about by the desire to win and the fear of failure before the competition. Will and other states of mental activity have a close relationship, awareness for the will to determine the purpose, emotionally motivated action, will and promote awareness, and control of emotions. Intellectual, emotional and practical factors of human activity are dynamically linked to the will. A person with a strong will is a person who is motivated by positivity and seeks to achieve a goal. Athletes with strong willpower are often able to overcome difficulties in sports competitions and show their higher level of sports competitions, while athletes with poor willpower, encountering difficulties not only affects their emotions, but also affects the physical and tactical level of play, indirectly affecting the performance of sports competitions. Because the negative quality of will is related to the conditioned reflexes of the vegetative nervous system of Jun, it will make the muscles suddenly weak, tachycardia, endocrine disorders and other phenomena (Adamec, Krbot Skorić, & Habek, 2021). Although the will cannot replace the technology and tactics, but it is technology and tactics in difficult conditions to get the normal play of the important psychological conditions. Stronger will even before the game is not full of physical strength, in the competition is still better to meet the technical and tactical use of the needs of the timid and weak, even before the game is full of physical strength, in the competition is also difficult to cope with the technical and tactical needs (Awoyera, Olalusi, & Iweriebo, 2021; Brown, Donahoe, & Boykin, 2022).

Attention allocation is a manifestation of competence that can be continuously improved through specialised training. Attention allocation must have certain conditions, namely, most of the objects or activities to which attention is paid are familiar or habitual, and only one of them is unfamiliar and does not require a high degree of attention. Depending on whether the object of attention is a response to an external objective or to one's own behaviour or internal mental activity, we classify the allocation of attention as external attention allocation, i.e., the object of allocation is attention to an external objective. Internal attention allocation, i.e., attention allocated to one's own behaviour or one's own mental activity. Internal and external attention allocation, i.e., attention allocated to both internal and external objects (Keller, Davidesco, & Tanner, 2020; Zheng, Bronson, & Lin, 2020). According to the number of objects of attention allocation, it can be divided into two-item attention allocation, i.e., there are only two objects of attention. Multiple allocation of attention, i.e., there are three or more objects of attention at the same time. From the point of view of the process of completing the technique of motor movements, attention plays a role all the time, and especially the distribution of attention plays a leading role in the quality of attention. The quality of attention distribution is particularly important in the completion of complex technical movements. When completing a technical movement, each technical link does not only appear in a single form, but several technical links appear at the same time, such as the upper and lower limbs at the same time, waist and legs at the same time, and

so on. When completing the movement, the athlete should pay attention to all the technical links, which is the process of attention distribution, only the intensity of attention to different links is different. At the same time to complete the technical action is often in a certain order and rhythm, that is, the attention of the technical aspects of the continuous change, this change is not the end of the previous link and then transferred to another link, but an alternating continuation of the process at the same time, so in the whole process of the attention allocated to the object of the attention of the strength of the weak is in constant change (Cherfan, Avgerinos, & Chaer, 2020).

Currently, there are more studies on the development status of the sport, the curriculum, the significance of the sport and the outlook of the future, while the research on the psychological aspects of the athletes is quite rare. Moreover, the focus of previous research is mostly on the curriculum of the sport and the importance of the sport to the students, while this study aims to combine the psychological quality with the characteristics of orienteering and find the relationship between the psychological quality, especially between the psychological quality and the performance of orienteering athletes, so as to help the athletes to improve their performance by improving their psychological quality in the training and competition. And provide a kind of reference for the training of athletes in the future, which has important application value and practical significance. The main contributions are as follows:

(1) The concept of quality education was highlighted in the construction of the contents and components of mental health qualities to reshape the content system of mental health qualities of young people, and the questionnaire on mental health qualities of athletes, which conformed to the norms of educational psychology surveys, was developed to provide an assessment tool for the relevant research.

(2) On the basis of identifying the logical and functional relationship between mental health quality and mental health, possible influencing factors of athletes' mental health quality were selected. Through the questionnaire survey, the relationship between young athletes' training, mental health quality and the aforementioned influencing factors was examined, and an intermediary model of sports and athletes' mental health quality was constructed by relying on the data modelling technique.

2. Methodology

As an important pillar of quality education, sports have the important advantage of combining practice and spirit in giving play to the functions of psychological education. However, due to the relative openness of sports education and the multi-dimensionality of its contents, although psychology education is included in sports education, it can often only be used "up to the

point", which is actually the helplessness of sports educators who attach great importance to the work of psychology education, but have no relevant educational basis to support their work. The present study takes the relationship between physical exercise and mental health status, and between mental health status and mental health quality as a starting point, and tries to explore the relationship between physical exercise and mental health quality of young people in terms of the characteristics of physical exercise, with a view to providing theoretical support in terms of the selection of means, methods and contents for the mental health education to be carried out at the stage of quality education in the future (Y. Ouyang, Yu, Cai, & Ye, 2024).

Over a long period of time, a large number of sports workers and educators have gradually recognized the rationality and necessity of integrating mental health education into sports. However, due to the complexity of sports, there are different associations between different conditions of sports and the mental health quality of athletes. For example, the main place of sports is in schools; the development of mental health quality in sports is mainly through penetration and integration; endurance sports have better development of athletes' mental quality, etc. Thus, it can be seen that there is a relationship between sports and mental health quality in athletes in different conditions. Thus, it can be seen that the development of mental health of athletes in sports often exists and occurs at the crossroads of various aspects, such as the situation, the environment and the content of education. These knowledge and rules are usually based on the long-term experience of physical education, teaching practice and relevant empirical research. Therefore, based on the meaning of mental health quality of athletes and the relationship between sports and mental health quality, this article, together with field surveys and interviews with experts, will conduct a comprehensive study on the cultivation of mental health quality of athletes in sports (Ramin et al., 2020; Torous, Myrick, Rauseo-Ricupero, & Firth, 2020).

2.1 Research Object

The sports value, guiding ideology, implementation principles, sports means, sports methods, process control and evaluation feedback that exist in the process of cultivating athletes' mental health quality in sports are the research objects of this article. Among them, some full-time sports teachers and sports organization management participants in some universities were the subjects of field surveys or telephone interviews; some experts and scholars with specialized research or senior practical experience in the field of sports psychology, or those who shape athletes' mental health and psychological quality Experts and scholars with research expertise in sports development and other aspects, as well as some experts and scholars in sports subjects who are more concerned about mental health quality education (including sports administrators, scholars in the field of sports, and scholars in the field of

education) are the experts interviewed for this article. In addition, the mental health of athletes The quality content system architecture is shown in Figure 1.

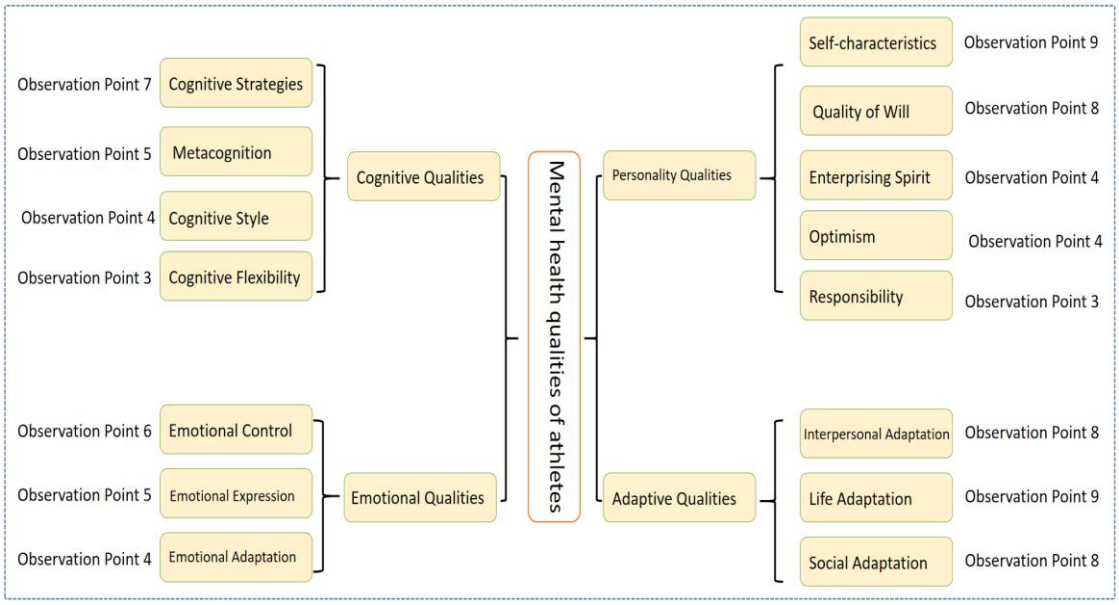

Figure 1: Schematic diagram of the content system structure of athletes' mental health quality.

2.2 Research Methods

2.2.1 Literature Method

To collect and collate literature on sports and mental health quality education, to understand the current status of mental health quality education in the sports and education system, and to grasp the trend and direction of future research and development in this area, so as to lay a theoretical foundation for the development of a pathway for the development of athletes' mental health quality in sports.

2.2.2 Field Investigation Method

To conduct selective and targeted field research in a certain geographical area to further understand the current situation of education on the promotion of physical fitness for mental health, to analyse the current situation of education, to observe in a planned and step-by-step manner the development of education on physical fitness for mental fitness among physical fitness teachers, after-school physical fitness activities for students and after-school physical fitness training, and to gain an in-depth and comprehensive understanding of the degree of importance attached to, and the means and focus areas of, education on the promotion of physical fitness for mental fitness in sports. It also identifies the deficiencies in the current implementation of promoting mental health quality in sports and provides detailed and objective

reference materials for this paper.

2.2.3 Expert Interview Method

According to the purpose of the research, this paper identifies several core issues in the education of young people's mental health quality in sports and invites relevant experts and scholars to convene a number of symposiums focusing on the urgent problems in the process of cultivating athletes' mental health quality in sports.

2.2.4 Hypothetical model of the intermediation effect

In this paper, the overall situation of athletes' participation in "physical education classes", "physical activity classes" and "amateur sports activities" is taken as the independent variable and defined as three variables $P^{(i)}$, $S^{(i)}$, $a^{(i)}$. The hypothetical model of the mediating effect of mental health quality of athletes is constructed. A hypothetical model of the intermediary effect of mental health qualities of athletes was constructed, and its calculation equations as follows:

$$M = P^{(i)} * \left(\alpha^{(i)} - 1\right) * S^{(i)} \quad (1)$$

In addition, since age and life adaptation are skewed distributions, Box-Cox transformations were performed. The transformation equation is defined as:

$$\gamma(\lambda) = \begin{cases} \dfrac{\gamma^{\lambda} - 1}{\lambda} & \lambda \neq 0 \\ \ln\gamma & \lambda = 0 \end{cases} \quad (2)$$

2.3 Pathway Construction of Mental Health Quality

2.3.1 Guidelines for the development of mental health qualities in athletes

As school sports are the main channel for the development of mental health quality of athletes, the guiding concept of sports intervening in the mental health quality of athletes is in fact to reasonably infiltrate the educational methods affecting the formation of mental health quality of athletes in school sports and to follow their basic developmental rules. School sports should embody the concept of mental health education in the selection of activities and the formulation of curricula. They should not only be appropriate to the age of students, but also take into account gender, and be in harmony with the development of the society at present. At the same time, since physical exercise has its own characteristics, the physical education teaching and after-school sports activities should also take into account students' physical and

physiological conditions and their mastery of sports skills, so as to reasonably arrange the contents of sports loads and disciplines to penetrate into the quality of education on mental health.

2.3.2 Implementation Strategies for Mental Health Quality Development

In order to achieve its intended objectives, mental health quality development must be implemented by certain methods and means and through certain channels. Therefore, the implementation strategy of mental health quality development is the core issue in realising the model of mental health quality development in sports. Athletes' mental health qualities are composed of four complex aspects, namely, "knowledge, emotion, intention and behaviour", which determines that the development of mental health quality training in schools not only requires the use of a variety of ways and forms, but also requires that these ways and forms organically form an integrated educational operating system. At present, education and health work in schools is mainly done by teachers, parents and students. Therefore, the development of mental health of athletes in sports requires a combination of comprehensive penetration and single-point teaching. The following is a compilation of materials obtained from expert interviews, fieldwork and data collation, and a discussion of the general and specific strategies for the development of mental health in sports. In general subject teaching, the objective of mental health education is a "secondary objective", or a "sub objective" or "auxiliary objective". In physical education and sports teaching or extra-curricular physical education and sports, participation in sports and sports skills are the primary objectives of physical education in schools. Students are required to practise physical exercises, acquire basic skills and abilities and knowledge of health care, so as to cultivate their attitudes, habits, interests and abilities to engage in physical exercises and sports and to achieve the objective of developing mental health education (Wang & Du, 2020). Therefore, in the process of physical exercise, the cultivation of mental health quality cannot replace the main task of physical exercise itself. It can only be a matter of priority and a relationship between the whole and the parts. Compared with other cultural programmes, physical education is more about gaining rich inner experience through hands-on activities. Throughout the teaching of physical education in the classroom, behaviours such as physical and mental restraint, teamwork, teacher-student evaluation and so on, subconsciously affect the students' view of mental health, which is not deliberate or forced, but a natural and reasonable manifestation.

2.3.3 Moderate and Flexible Penetration

The so-called "moderate penetration" means that the development of mental health quality should be infiltrated into sports in a "timely and appropriate manner". The concept of "appropriateness" embodies a clear objective of prioritisation. In the course of physical education and sports, the primary

objective is not to educate mental health quality, which requires that the cultivation of mental health quality should be infiltrated in an appropriate manner. Firstly, as the main body of learning in the whole classroom, students must be infiltrated in a gradual and orderly manner in accordance with their needs, physical and mental development, and personalities, etc. Secondly, teachers, as the main body of learning in the curriculum, should be responsible for the development of mental health. Secondly, the teacher, as the leader of the programme, should insert appropriate infiltration contents to cater for the performance and intuitive needs of students, so as to grasp the best opportunity for infiltration. Secondly, the level of osmosis should be controlled, as it is difficult to achieve the desired effect if it is too low or too high. There are many different approaches to the development of mental health in sports. From the perspective of the education programme, developing students' mental health through subject penetration can enhance their basic cognitive skills, such as spatial reaction, imagination, anticipation, etc., so as to enable them to form a complete self-cognitive space. They can acquire the knowledge they need from different sports. The teaching of sports is a vast and rich teaching process. The learning of sports develops the ability to participate and solve problems independently, and in this process, independence is the primary issue addressed in MHQE. Secondly, the endurance and tenacity of students who have completed physical exercise are good opportunities for the development of mental and moral qualities. Secondly, in the process of physical exercise, teacher-student evaluation, student-student evaluation and self-evaluation create an atmosphere of timely problem solving for learning. When tasks are difficult to complete, teachers and students help students to break through themselves and grow up in a team, and sports are conducted in the form of games. The whole programme consists of entertainment, fun and competition. The variety of forms and flexibility of sports activities also provide more possibilities for the infiltration strategy of mental health quality cultivation.

2.4 Strategy Design

2.4.1 Strategies for cultivating personality quality in the process of sports

Personality quality is an important part of mental health quality. In order to achieve the transformation of young people from natural persons to social beings, sports must not only improve the normative awareness of young students, but also improve the personality qualities of young people themselves, and further develop positive and hard-working personality qualities. In addition, they must also overcome laziness. Negative personality traits of being distracted and fearful. Some scholars have found that teenagers who regularly participate in sports will have significantly improved physical fitness, less mood swings, can communicate with others more confidently, are energetic and have strong adaptability; while those who do not regularly participate in sports will with weak willpower and poor physical fitness, personality development is more

likely to go awry. According to previous sociological surveys and research, students who often participate in sports will also participate in more social activities than students who do not often participate in sports. In the process of participating in these activities, adolescents will also gain more personality. Break-in and absorption of advantages. Those teenagers who have long-term sports habits have more stable personality development. Although the choice of sports has a great relationship with personality quality preferences, the supporting role of sports on personality quality, especially in terms of personality, will, etc., is very far-reaching.

2.4.2 Strategies for the development of interpersonal qualities in sport

Interpersonal quality comprises both interpersonal interaction and interpersonal relationship. Interaction refers to the process of information exchange and emotional communication between people in the course of social activities. Sports provide opportunities for human contact and interaction. Through participation in sports, one can forget troubles and pains, eliminate the feeling of loneliness in the mind, and enable students to gradually develop the awareness and habit of interacting with others. It has been shown that extroverts have a stronger need for social interaction than introverts, and that this social need can be satisfied through collective physical exercise. The participation of introverts in collective sports can lead to a gradual change in their personality. In terms of interpersonal relationship, sports are also the best way to strengthen interpersonal contact, which can lead to a good improvement in interpersonal relationship. Through contact and communication with other students in sports, students will develop a sense of intimacy with each other and thus acquire the ability to interact with other students in a proper manner. Thus, in this respect, physical exercise is conducive to the harmonisation of interpersonal relationships and enables individuals in the same group to learn to care for and look after each other, to understand each other and to help each other, thus naturally forming a stable and good interpersonal relationship.

3. Experiment and Results

3.1 Research Data

Firstly, collate and analyses the data in the athlete's questionnaire on the indicators of psychological quality of male and female athletes participating in a regional sports competition in 2022, and then take the average of the data of each indicator, and the results of male and female athletes participating in a sports competition in 2023 entered into the software to carry out data processing and statistical analysis using the correlation analysis method, to test the correlation between the athletes' performance and psychological quality. The results of the study and the analysis of the scientific processing of the relevant data to ensure the validity of the results of the study. The results of the

athletes are based on the ranking of the athletes in the competition.

3.2 Experimental results and analysis

Table 1: Statistical table of correlation between athletes' sports performance and various indicators of psychological quality.

VARIANT	CORRELATION COEFFICIENT	VALUE P
COGNITIVE STATE ANXIETY	-0.256	0.430
SOMATIC STATE ANXIETY	-0.479	0.000
STATUS CONFIDENCE	0.312	0.012
PURPOSEFULNESS OF THE QUALITY OF WILL	0.483	0.000
SELF-CONTROL OF THE QUALITY OF WILL	0.212	0.046
INITIATIVE OF THE QUALITY OF WILL	0.297	0.017
TENACITY OF WILL	0.476	0.024
BREADTH OF ATTENTION	0.322	0.010
DISTRIBUTION OF ATTENTION	0.410	0.001
DIVERSION OF ATTENTION	0.376	0.002
STABILITY OF ATTENTION	0.330	0.000

As shown in Table 1, the statistical results show that there is a negative correlation between cognitive anxiety and somatic anxiety and sports performance, and somatic anxiety is highly negatively correlated with the level of somatic anxiety, while cognitive anxiety is lowly negatively correlated with sports performance. From a psychological point of view, anxiety is an inverted curve, and when an athlete's anxiety is too high, his arousal level tends to decrease, thus affecting performance. Only when the level of anxiety is at an appropriate level will it contribute well to the athlete's performance, thus improving the athlete's performance. Purposefulness, attention allocation, attention transfer, and attention stability of the volitional qualities are all highly positively correlated with athletic performance at the level, which shows that there is a closer relationship between purposefulness, attention allocation, attention transfer, and attention stability of the volitional qualities and athletic performance, and that this relationship is positive and significant. The purposefulness of the athlete's will quality shows a kind of determination to participate in a certain competition. When the purposefulness of the will quality is stronger, his motivation and state will be adjusted to the best state and stimulate his aggressiveness, so the stronger the purposefulness of the will quality is, the easier it is to motivate him to achieve better results. The transfer and distribution of attention is very demanding for athletes. In orienteering competitions, athletes have to change their travelling route all the time according to the constant changes of the terrain. According to the new task, they have to take the initiative to transfer their attention from one object to

another, and they have to grasp the allocation of attention to observe the surrounding terrain and landscape features during the process of travelling, so the athletes have to transfer and allocate their attention between the map, the environment, and the ground condition constantly. Athletes' attentional stability requires athletes to keep feeling a certain activity for a long time, if athletes' attention is not concentrated in the game, they are easily disturbed by the surrounding people and the environment, which will disturb the athletes' judgement, thus affecting the athletes' performance. Therefore, it is also logical and factual that the shift of attention, the distribution of attention and the stability of attention maintain a high correlation with the performance of the athlete. State Self-confidence, self-control of will quality, initiative of will quality, tenacity of will quality, breadth of attention and athletic performance have a low positive correlation at the level.

Table 2: Stepwise regression analysis of the relationship between the main psychological quality indicators affecting the sport performance of college orienteering athletes and their performance.

ORDER	BATA	STANDARD ERROR	T	SIG.	VIF
CONSTANT	0.720	-	3.431	0.001	-
PURPOSEFULNESS OF THE QUALITY OF WILL	0.162	0.170	4.249	0.000	1.343
ATTENTION TO STABILITY	0.134	0.151	3.931	0.000	1.232
SELF-CONTROL OF THE QUALITY OF WILL	0.171	0.163	4.103	0.000	1.321
BREADTH OF ATTENTION	0.146	0.147	3.799	0.000	1.259
TENACITY OF WILL	0.098	0.108	2.973	0.003	1.101
DISTRIBUTION OF ATTENTION	0.093	0.106	2.939	0.003	1.091
STATE OF CONFIDENCE	0.057	0.021	2.895	0.004	1.045

Through the correlation analysis of the main psychological quality indicators affecting athletes and sports performance, we have clearly understood the degree of correlation between the cognitive state of anxiety, somatic state of anxiety, state of self-confidence, willfulness of purpose, willfulness of self-control, willfulness of initiative, willfulness of perseverance, breadth of attention, distribution of attention, transfer of attention, and stability of attention of big athletes and sports performance. We all know that correlation analysis only determines whether there is a relationship between the factors and the closeness and direction of the relationship, and then we need to further explore whether these influencing factors and their dimensions have a causal relationship with athletic performance, so in this part of the study, the multiple stepwise regression analysis is used to predict the extent of the influence of these influencing factors on college orienteering athletes' athletic performance. Using college orienteering athletes' sports performance as the dependent variable, and eleven factors, namely cognitive state anxiety, somatic state

anxiety, state self-confidence, will quality of purpose, will quality of self-control, will quality of initiative, will quality of perseverance, breadth of attention, allocation of attention, shifting of attention, and stability of attention, as the independent variables, regression analyses were carried out. As shown in Table 2, the stepwise regression of college orienteering athletes' main psychological quality indexes and sports performance, as the residual value without self-correlation is one of the most important assumptions that should be observed in the regression analysis, the Durbin-Watson test is the most commonly used method to test the self-correlation of the residual value, and its value is between 0-4, and when the Durbin-Watson value, which is obtained according to the residual value, is around 2, it indicates that the residual values do not violate the self-correlation. And,3 shows that the model Durbin-Watson value is 2.791 therefore it can be assumed that there is no self-correlation problem. In addition, the validation of multi-collinearity was also carried out for each influence factor, and the variance inflation factor VIF was used to measure the existence of multi-collinearity, usually the VIF value between 0-10 does not exist multi-collinearity, according to Table 2, the VIF value shows that all the factors entered into the regression of the VIF are in the range of 0-10, so it can be judged that there is no multi-collinearity in this study.

According to the relevant theory of factor loading analysis, the larger the factor loading value of the observed variable, the higher the correlation between the factor and the original indicator, and the more information it contains about the indicator, indicating that the observed variable is closely related to the common factor. As the initial factor loading matrix structure is not clear enough, the typical representative variables of each factor are not very prominent, which makes it very difficult to interpret the factors.

In order to obtain a good factor structure, this paper adopts the variance-maximizing orthogonal rotation method to rotate the factors, adjust and simplify their structure, and obtain the variance-maximizing orthogonal rotated factor loading matrix. The factor loading coefficient is an index reflecting the degree of correlation between the factor and each variable, and the larger its absolute value is, the greater the influence of the factor on the current variable is.

Table 3(a): First-order factor loading matrix after very high variance orthogonal rotation.

ID	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
31	0.757	-	-	-	-	-	-	-	-	-	-
39	0.739	-	-	-	-	-	-	-	-	-	-
21	0.378	-	-	-	-	-	-	-	-	-	-
34	0.537	-	-	-	-	-	-	-	-	-	-
41	0.544	-	-	-	-	-	-	-	-	-	-
3	-	0.790	-	-	-	-	-	-	-	-	-
5	-	0.767	-	-	-	-	-	-	-	-	-

Table 3(b): First-order factor loading matrix after very high variance orthogonal rotation.

ID	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
9	-	0.592	-	-	-	-	-	-	-	-	-
13	-	0.555	-	-	-	-	-	-	-	-	-
1	-	0.539	-	-	-	-	-	-	-	-	-
22	-	0.527	-	-	-	-	-	-	-	-	-
20	-	-	0.782	-	-	-	-	-	-	-	-
4	-	-	0.377	-	-	-	-	-	-	-	-
6	-	-	0.580	-	-	-	-	-	-	-	-
14	-	-	0.535	-	-	-	-	-	-	-	-
29	-	-	-	0.372	-	-	-	-	-	-	-
33	-	-	-	0.705	-	-	-	-	-	-	-
26	-	-	-	0.639	-	-	-	-	-	-	-
19	-	-	-	0.564	-	-	-	-	-	-	-
7	-	-	-	0.555	-	-	-	-	-	-	-
25	-	-	-	-	0.790	-	-	-	-	-	-
28	-	-	-	-	0.613	-	-	-	-	-	-
27	-	-	-	-	0.607	-	-	-	-	-	-
37	-	-	-	-	0.570	-	-	-	-	-	-
23	-	-	-	-	0.544	-	-	-	-	-	-
36	-	-	-	-	-	0.674	-	-	-	-	-
24	-	-	-	-	-	0.606	-	-	-	-	-
12	-	-	-	-	-	0.587	-	-	-	-	-
17	-	-	-	-	-	0.568	-	-	-	-	-
30	-	-	-	-	-	-	0.678	-	-	-	-
35	-	-	-	-	-	-	0.506	-	-	-	-
40	-	-	-	-	-	-	0.433	-	-	-	-
42	-	-	-	-	-	-	0.404	-	-	-	-
8	-	-	-	-	-	-	-	0.635	-	-	-
38	-	-	-	-	-	-	-	0.653	-	-	-
15	-	-	-	-	-	-	-	-	0.803	-	-
16	-	-	-	-	-	-	-	-	0.755	-	-
11	-	-	-	-	-	-	-	-	-	0.671	-
2	-	-	-	-	-	-	-	-	-	0.578	-

Table 3(c): First-order factor loading matrix after very high variance orthogonal rotation.

ID	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
32	-	-	-	-	-	-	-	-	-	0.533	-
10	-	-	-	-	-	-	-	-	-	-	0.695
18	-	-	-	-	-	-	-	-	-	-	0.537

As shown in Table 3, the first factor F1 (31,39,21,34,41), this factor is "span of attention" and the second factor F2 (3,5,9,13,1,22) For "the purposefulness of the athlete's will and quality." The third factor F3(20,4,6,14) is "Athletes' Cognition". The fourth factor F4 (29, 33, 26, 19, 7) is "distribution of attention." The fifth factor F5 (25, 28, 27, 37, 23) is "stability of attention". The 6th The first factor F6 (36, 24, 12, 17) is "physical state anxiety". The seventh factor F7 (30, 35, 40, 42) is "shift of attention". The eighth factor F8 (8, 38) is "state self-confidence". The ninth factor F9 (15,16) is "the self-control of the athlete's will quality". The 10th factor F10 (11,2,32) is "the initiative of the athlete's will quality". The 11th factor F11(10,18) is "the tenacity of the athlete's will quality". The above analysis shows that the results of the factor analysis are basically consistent with the previous expectations. From the main factor eigenvalues, contribution rate, cumulative contribution rate and index loading, we can see the ranking of the main psychological qualities that affect athletes' sports performance. This is the basis for the paper. provides a strong basis for further research.

Table 4: Purposeful descriptive statistics of willpower quality between orienteering and non-orienteering athletes List of willpower quality between orienteering and non-orienteering sports.

TYPE	PROPORTION	MEAN	STD
NON-ORIENTED ATHLETE	34%	19.1870	4.12256
ORIENTATED ATHLETE	66%	19.3265	3.06552

In addition, the will is consciously determined, regulate the action to overcome difficulties to achieve the purpose of the psychological process. The content of the quality of will includes the purposefulness of the firm quality of will, the tenacity of the quality of will, the initiative of the quality of will and self-control, etc. The so-called purposefulness of the firm quality of will is that the athletes in the training and competitions, not only to have a clear purpose, but also to strive to achieve the goal of the so-called tenacity of the quality of will, that is, the athletes are asked to participate in competitions or daily training, it is necessary to have a great suffering and endurance of the tenacious essence of will. The so-called tenacity of will quality is to require athletes, whether participating in competitions or daily training, to have the tenacity to endure great hardship and persevere The initiative of will quality is to educate athletes to have a strong desire to create excellent results Self-control ability is to

educate and cultivate athletes to be good at controlling their own emotions and actions, grasping the appropriate intensity of training and competitions, and effectively adjusting the imbalance of psychological state brought by the desire for victory and the fear of failure before the competitions. Table 4 shows the average score of purposefulness of willfulness between orienteering athletes and non-orienteering sports, the proportion of non-orienteering athletes is 34%, the average score of purposefulness of willfulness is 19.1870, the standard deviation is 4.12256, the proportion of orienteering athletes is 66%, the average score of purposefulness of willfulness is 19.3265, the standard deviation, 3.06552. In order to examine the variability of purposefulness of will quality between orienteering athletes and non-orienteering athletes, independent samples t-test was used for statistical analysis, and variance chi-square test was conducted first, which can be seen in Table 5, and the results of the variance chi-square test showed that: F=2.554, P=0.111>0.05, which indicates the variance chi-square. Therefore, the t-test result corresponding to the assumption of variance chi-square is correct, proving that there is no significant difference in the purposefulness of the athletes' willfulness.

Table 5: Statistical table of purposeful T-tests of volitional qualities between orienteering athletes and non-orienteering sports.

F	SIG.	DF	SIG.(2-TAILED)
2.554	0.111	0.305	0.761

4. Conclusion

In this paper, we take the theory and application of mental health quality as the background, and the relationship between sports and athletes' mental health quality as the starting point, and conduct a step-by-step research that is both exploratory and verification. In order to promote the theoretical development of athletes' mental health quality research, enrich the theory of sports promotion of athletes' mental health development, and provide reference and support for the cultivation practice of mental health quality in quality education work.

Firstly, using "what is mental health quality" as the keyword, the "Athletes' Mental Health Quality Questionnaire" was compiled and tested using methods such as questionnaires, interviews and mathematical statistics. Secondly, based on the theory of the relationship between sports and mental health quality, using "how sports affect mental health quality" as the keyword, we select appropriate psychological, physiological and social indicators, select a number of athletes as subject samples, and use questionnaire surveys and mathematical Statistics are used as the main method to explore the relationship between sports and mental health quality and its mediating effect model. In order to clarify and optimize the effect of psychological quality training in improving athletes' performance, and provide a reference for research in

related fields.

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