PSYCHOLOGICAL QUALITY IN MIDDLE AND LONG-DISTANCE TRAINING

QUALIDADE PSICOLÓGICA NO TREINAMENTO DE MÉDIA E LONGA DISTÂNCIA

CALIDAD PSICOLÓGICA EN EL ENTRENAMIENTO DE MEDIA Y LARGA DISTANCIA

Original Article
Artigo Original
Artículo Original

Wutao Tian[1]
(Physical Education Professional)
Shurui Jiao[2]
(Physical Education Professional)

1. Huanghe Science and Technology University, Department of Public Physical Education, Zhengzhou, Henan, China.
2. Huanghe Science and Technology University, School of Foreign Languages, Zhengzhou, Henan, China.

Correspondence:
Wutiao Tian
Zhengzhou, Henan, China. 450063.
twt3600@163.com

ABSTRACT

Introduction: Middle and long-distance running combine endurance and speed, demanding constant speed and minimizing physical losses. Sports fatigue is frequent in competition and the practice of these races. Therefore, middle and long-distance runners are prone to characteristics such as nervousness, negativity, or boredom. Objective: Explore the role of mental health in middle and long-distance runners in track and field events. Methods: Fourteen Chinese middle and long-distance runners were selected. The players undergo a 10-week psychological quality test. A questionnaire survey was conducted before and after completing the 10 weeks of psychological quality education. The data obtained from the experiment were statistically analyzed. The practical teaching of athletes and the form of psychological education were explained and discussed. Results: The psychological quality of stability in the athletes' movements are reflected inaccurate feedback, the balance of challenging skills, a high sense of control, concentration, and clear purpose. The characteristics of psychological quality were a fusion of awareness of behavior, pleasant experience, loss of self-consciousness, and space-temporal transformation. There were significant differences in the level of stable psychological quality of athletes under different sports levels (P<0.05). Conclusion: Mental quality promotion exercises for middle and long-distance runners can help them to quickly adjust their minds, improving their competitive abilities. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Adaptation, Psychological; Athletes; Running; Conditioning, Psychological.

RESUMO

Introdução: A corrida de média e longa distância combina resistência e velocidade, exigindo constante velocidade e minimização das perdas físicas. A fadiga esportiva é frequente na competição e na prática dessas corridas. Portanto, os corredores de média e longa distância estão propensos a características como nervosismo, negatividade ou tédio. Objetivo: Explorar o papel da saúde mental nos corredores de média e longa distância em eventos de atletismo. Métodos: Foram selecionados 14 corredores chineses de média e longa distância. Os jogadores passam por um teste de qualidade psicológica de 10 semanas. Foi realizada uma pesquisa por questionário antes e depois de completar as 10 semanas de educação de qualidade psicológica. Os dados obtidos a partir do experimento foram analisados estatisticamente. O ensino prático dos atletas e a forma de educação psicológica foram explanados e discutidos. Resultados: A qualidade psicológica da estabilidade nos movimentos dos esportistas reflete-se em feedback preciso, equilíbrio das habilidades desafiadoras, alto senso de controle, concentração e propósito claro. As características da qualidade psicológica foram a fusão da consciência do comportamento, experiência agradável, perda da autoconsciência e transformação espaço-temporal. Houve diferenças significativas no nível de qualidade psicológica estável dos atletas sob diferentes níveis esportivos (P<0,05). Conclusão: Exercícios de promoção para a qualidade mental aos corredores de média e longa distância podem ajudá-los a ajustar rapidamente sua mente, melhorando suas capacidades competitivas. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Adaptação Psicológica; Atletas; Corrida; Condicionamento Psicológico.*

RESUMEN

Introducción: La carrera de media y larga distancia combina resistencia y velocidad, exigiendo una velocidad constante y la minimización de las pérdidas físicas. La fatiga deportiva es frecuente en la competición y en la práctica de estas carreras. Por lo tanto, los corredores de media y larga distancia son propensos a características como el nerviosismo, la negatividad o el aburrimiento. Objetivo: Explorar el papel de la salud mental en los corredores de media y larga distancia en las pruebas de atletismo. Métodos: Se seleccionaron catorce corredores chinos de media y larga distancia. Los jugadores se someten a una prueba de calidad psicológica de 10 semanas. Se realizó un cuestionario antes y después de completar las 10 semanas de formación en calidad psicológica. Los datos obtenidos del experimento se analizaron estadísticamente. Se explicó y discutió la enseñanza práctica de los atletas y la forma de educación psicológica. Resultados: La calidad psicológica de la estabilidad en los movimientos de los atletas se refleja en una retroalimentación precisa, un equilibrio de habilidades desafiantes, un alto sentido de control, concentración y un propósito claro. Las características de la calidad psicológica eran la fusión de la conciencia del comportamiento, la experiencia placentera, la pérdida de la conciencia de sí mismo y la transformación espacio-temporal. Hubo

diferencias significativas en el nivel de calidad psicológica estable de los atletas en los distintos niveles deportivos (P<0,05). Conclusión: Los ejercicios de promoción de la calidad mental pueden ayudar a los corredores de media y larga distancia a ajustar rápidamente su mente, mejorando sus capacidades competitivas. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Adaptación Psicológica; Atletas; Carrera; Condicionamiento Psicológico.*

DOI: http://dx.doi.org/10.1590/1517-8692202329012022_0648 Article received on 11/01/2022 accepted on 11/25/2022

INTRODUCTION

Technical and tactical training methods are constantly improving in the development of competitive sports. This gradually narrows the technical ability gap between athletes and athletes. Mental skills training has gradually become a breakthrough for breaking athletes' performance. Psychological quality training uses specific methods and means consciously and purposefully to enable athletes to obtain good psychological adjustment ability.[1] This facilitates its rapid regulation of the mental state. Middle-distance running is a fast, high-endurance event in track and field competitions. It is easy to cause exercise fatigue in competition and practice because athletes often do the same exercise. Players tend to have mental characteristics such as nervousness, negativity, or boredom. We should use positive and efficient mental skills training methods to improve the emotional state of the players during the competition. Long-distance runners achieve the goal of breaking obstacles and obtaining excellent results through psychological quality training.

METHOD

Research objects

This thesis mainly aims at the "psychological training" intervention for middle and long-distance runners.[2] This article selects 14 Chinese middle-distance runners. Players undergo a 10-week psychological quality test. Athletes are 10-14 years old and have been trained for 2-5 years.

Investigation method

This paper's re-measurement of the "Mental State Questionnaire for Long-distance Runners" obtained a reliability factor of r=0.891. The psychological training group was conducted by a group composed of 6 coaches and three sports psychology experts. The content included five parts: confidence training, psychological stability training, concentration training, simulation training, and relaxation training.[3] The middle-distance runners used ten weeks of mental quality training. And two interventions with media, 30-45 min each. This study used a self-rating scale to pretest the subjects to obtain their initial mental state. Athletes took post-tests ten weeks after the trial was completed. exist

The method of measuring foot posture in middle and long-distance running

In this paper, the quaternary error value p_e is used as the state value of the filter. The text multiplies the quaternion number $\hat{p}$ with the number p in quaternion.[4] In this paper, the error quaternion is used as the rotation quaternion of the prediction quaternion.

$$p = \hat{p} * p_e \tag{1}$$

α_o is the output of a gyrator. α represents the angular velocity value, and the offset value ε_g is the sum of the Gaussian white noise u_g. This paper studies the difference method of the quaternion p_e. In this paper, the quaternion ordinary kinematics equation is deduced from the quaternion differential equation, kinematics equation, and rotor error equation

$$\dot{p}_e = -[\alpha_o \times] p_e - \frac{1}{2}(\varepsilon_g + u_g) \tag{2}$$

The 3-time operation vector $[m\mathbf{x}]$ is defined in the formula (2). Below is the format

$$[m\times] = \begin{pmatrix} 0 & -t_3 & t_2 \\ t_3 & 0 & -t_1 \\ -t_2 & t_1 & 0 \end{pmatrix} \tag{3}$$

In this paper, the quaternary error and the offsets on the three axes are used as the state vector of the system, respectively. $x = [p_{e1}, p_{e2}, p_{e3}, \varepsilon_{gx}, \varepsilon_{gy}, \varepsilon_{gz}]$.

The state transition equations of the system and the system noise are $f(x(\lambda))$ and $w(\lambda)$:

$$\begin{cases} f(x(\lambda)) = \exp\left(\begin{pmatrix} -\alpha_o \times] & I/2 \\ 0 & 0 \end{pmatrix} \times T\right) x(\lambda) \\ w(\lambda) = T\begin{pmatrix} -u_g/2 \\ u_{\varepsilon g} \end{pmatrix} \end{cases} \tag{4}$$

Data analysis

This paper uses the card method to verify the data. This study aims to explore the application of mental quality training to athletes' mentality and skills in different situations.

Ethical Compliance

Research experiments conducted in this article with animals or humans were approved by the Ethical Committee and responsible authorities of Huanghe Science and Technology University following all guidelines, regulations, legal, and ethical standards as required for humans or animals.

RESULTS

The patient's self-confidence level was higher than before the intervention. There was a significant difference between the two (2=9.08, P<0.05) (Table 1). Fieldwork and interviews found that most subjects could adjust their motivation to compete after receiving systematic psychological training.[5] Their awareness and motivation have improved significantly. Its confidence in its technology has also increased. Many subjects even wrote in the questionnaire: "I am very confident that I can compete. I used to be nervous when I met an unfamiliar opponent, but now I want to compete with everyone to see who is better."

The subjects' attention height after interventional treatment was higher than after, and the difference was statistically significant (2=12.53, P<0.01). 73.08% of the subjects maintained a high degree of concentration after the interventional treatment.[6] They do not feel any pressure when encountering unfamiliar enemies and are not affected by outside sounds in noisy situations.

Table 1. Subjects' mentality changes before and after the intervention.

Project		Self-confidence	level of concentration
before intervention/%	High/strong	32.39	36.43
	Generally	32.39	24.29
	Low/weak	40.48	44.54
Post-intervention percentage/%	High/strong	68.82	76.93
	Generally	28.34	24.29
	Low/weak	8.09	4.05
χ2 value		9.08	12.53
P value		<0.05	<0.01
Project		**Psychological adaptability**	**Relieve tension and eliminate fatigue**
before intervention/%	High/strong	28.34	28.34
	Generally	32.39	28.34
	Low/weak	44.54	48.58
Post-intervention percentage/%	High/strong	64.78	72.87
	Generally	32.39	28.34
	low/weak	8.09	4.05
χ2 value		10.24	14.88
P value		<0.01	<0.01

It is more able to focus on its technology and strategy. After psychotherapy, patients were significantly better than interventional therapy in eliminating tension and fatigue (P<0.01). It shows that the relaxation training in the competition can help the students adjust their mentality quickly.[7] This will make your skills and techniques better played. Mid- and long-distance running can quickly relieve stress and fatigue after a high-load exercise.

The technical and strategic abilities of the patients after interventional therapy were significantly different from those in the interventional therapy group (2=8.61, P<0.05). This also illustrates the importance of "mental training" in improving the subjects' mental quality and training ability. (Table 2)

Table 2. Changes in training intensity before and after subject training.

Project		Technical and tactical level
% before intervention	Extraordinary	24.29
	normal	32.39
	Abnormal	48.58
% before intervention	Extraordinary	52.63
	normal	40.48
	Abnormal	12.15
χ2 value		8.61
P value		<0.05

DISCUSSION

Training period for middle-distance runners

The daily training of middle-distance runners is a tough, monotonous job. Middle-distance runners repeat a technical movement for a long time. Athletes live in a fixed living environment for a long time.[8] Athletes in their teenage years generally experience boredom, boredom, and depression. As a result, athletes' interest in middle and long-distance running will also be significantly reduced. Self-motivation refers to the pursuit of self-improvement and a sense of success in training to achieve the goal of improvement or success. Self-prompt method refers to the practice of using one's own words in practice to achieve a good mental state. Ultimately assist the athlete in achieving the training purpose.[9] Changing the training ground to training outdoors or on the field is a method called "cross-country racing." Because in this case, the players will be in a state of ecstasy for long-distance training. In this way, the burden on the athlete's body will be significant in achieving better training results.

The influence of pre-competition psychological quality training on middle and long-distance runners

Due to the differences in the players' characteristics, grades, and levels, the coaches also have different training objectives and tasks for each athlete. This will particularly impact the players' mentality.[10] For players who are excited, poor in strength, and lack competition experience, the "spiritual transmission" method can be adopted. This reduces the tension in the athlete. The coach can choose some sports with moderate content, novel form, and unrelated to competition according to the player's character and hobbies to arouse the player's interest. For example, athletes can listen to relaxing music. While middle-distance runners need ten workouts with or without stress simultaneously, their conditions are entirely different. For example, they will be more relaxed after a psychological quality intervention. For young, lack confidence, players can use the "self-prompt" or "imagination" method to adjust the players' mentality and enhance confidence.[11] Enhance daily practice and understanding of strategies by watching videos, for example.

Psychological training for middle and long-distance runners

Athletes should make full use of their advantages in middle and long--distance running. There are training styles in daily training that require less physical stimulation, while other training activities require higher physical stimulation. These are all to improve the state of the game.[12] Athletes learn how to self-regulate. Middle-distance runners use the number of heartbeats to determine their optimal level of hyperactivity. Athletes use this method to understand their self-control. If players feel too excited before the game, they can train by meditating, listening to soft music, and recalling quiet scenery. When the players are not in a high mood, they can do some simple warm-up activities. For example, you can do gymnastics or listen to a passionate song.[13] Athletes must have rich experience in participating in the competition and enough time to adapt to the competition. Coaches need to formulate corresponding countermeasures for targeted simulation training. This increases the stamina of the player.

Post-competition psychological training for middle and long-distance runners

Coaches should properly instruct athletes to adjust their mental state after the game. Athletes must communicate with their teammates to learn from their successes and mistakes. Sharing experiences can also help them adjust themselves in their daily lives. This allows them to see their successes and failures better.

CONCLUSION

"Psychological training" has noticeable or pronounced effects on athletes' self-confidence, concentration, psychological adaptability, and technical and tactical level, alleviating tension and fatigue. Psychological quality training is a training method that adapts to psychological development characteristics. It is beneficial for athletes to adjust their psychological conditions and improve their competitive level quickly. Mental quality training has a particular promotion value in middle and long-distance running.

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: Each author made significant individual contributions to this manuscript. Wutao Tian: writing and data analysis; Shurui Jiao: article review and intellectual concept of the article.

REFERENCES

1. Rasulovich RR. Age-Specific Dynamics of Attack and Defense Response Speed in Handball Players. WoS. 2022;3(1):414-23.
2. Strykalenko Y, Shalar O, Huzar V, Voloshinov S, Yuskiv S, Silvestrova H, et al. The correlation between intelligence and competitive activities of elite female handball players. J Phys Educ Sport. 2020;20(1):63-70.
3. Qiu Y, Tian H, Lin Y, Zhou W. Serious leisure qualities and participation behaviors of Chinese marathon runners. IRSS. 2020;55(5):526-43.
4. Ibragimov AK, Muxiddinovich LA. Individualization of psychological training of qualified handball players. WoS. 2021;2(4):234-41.
5. Ilxomovich MF. The analysis of the dynamics of the volume and quality of technical and tactical actions of young players'performance. WoS. 2022;3(1):343-54.
6. Ma SC, Kaplanidou K. Effects of event service quality on the quality of life and behavioral intentions of recreational runners. Leis Stud. 2021;44(1):1-21.
7. Tison GH, Avram R, Kuhar P, Abreau S, Marcus GM, Pletcher MJ, et al. Worldwide effect of COVID-19 on physical activity: a descriptive study. Ann Intern Med. 2020;173(9):767-70.
8. Kosik KB, Johnson NF, Terada M, Thomas-Fenwick AC, Mattacola CG, Gribble PA. Health-related quality of life among middle-aged adults with chronic ankle instability, copers, and uninjured controls. J Athl Train. 2020;55(7):733-8.
9. Van Hooren B, Goudsmit J, Restrepo J, Vos S. Real-time feedback by wearables in running: Current approaches, challenges and suggestions for improvements. J Sports Sci. 2020;38(2):214-30.
10. Malik P, Patel K, Pinto C, Jaiswal R, Tirupathi R, Pillai S, et al. Post-acute COVID-19 syndrome (PCS) and health--related quality of life (HRQoL)—A systematic review and meta-analysis. J Med Virol. 2022;94(1):253-62.
11. Charest J, Grandner MA. Sleep and athletic performance: impacts on physical performance, mental performance, injury risk and recovery, and mental health. Sleep Med Clin. 2020;15(1):41-57.
12. Åvitsland A, Leibinger E, Haugen T, Lerum Ø, Solberg RB, Kolle E, et al. The association between physical fitness and mental health in Norwegian adolescents. BMC Public Health. 2020;20(1):1-10.
13. Singh RS, O'Brien WH. The impact of work stress on sexual minority employees: Could psychological flexibility be a helpful solution?. Stress Health. 2020;36(1):59-74.