

# PSYCHOLOGICAL INJURIES IN YOUNG BOXERS

LESÕES PSICOLÓGICAS EM JOVENS BOXEADORES

LESIONES PSICOLÓGICAS EN JÓVENES BOXEADORES



ORIGINAL ARTICLE  
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## ABSTRACT

**Introduction:** Boxing is a fighting sport, and many factors cause physical injuries in athletes because of how they compete and train. Injuries are common for athletes who usually participate in this sport. Based on this, the relationship between positive psychological quality at the sport level should be explored, providing a theoretical basis for cultivating optimistic personalities in young athletes. **Objective:** Analyze the psychological injuries in young boxers to establish a standard to improve the psychological quality evaluation system of young athletes in China. **Methods:** By comparing the characteristics of different injuries, the possibility of injury occurrence in different activities can be explored, providing a theoretical basis to guide injury prevention, then promoting sports injury prevention. **Results:** The study shows that through professional training methods to improve the psychological quality of young boxers, these sportsmen should also recognize the importance of psychological training. **Conclusion:** Technical help in this approach can complete healthy training, aiming to meet the demands of the sport and collaborate to achieve better results. **Level of evidence II; Therapeutic studies - investigating treatment outcomes.**

**Keywords:** Psychology; Boxing; Injuries, Sports.

## RESUMO

**Introdução:** O boxe é um esporte de luta, havendo muitos fatores que causam lesões físicas nos atletas pelo modo de competição e treinamento. As lesões são comuns para os atletas que costumam participar desse esporte. Baseado nisso, a relação entre qualidade psicológica positiva ao nível esportivo deve ser explorada, fornecendo uma base teórica para o cultivo da personalidade otimista aos jovens atletas. **Objetivo:** Analisar as lesões psicológicas em jovens boxeadores visando embasar uma norma para melhorar o sistema de avaliação da qualidade psicológica dos jovens atletas na China. **Métodos:** Comparando as características de diferentes lesões, a possibilidade de ocorrência de lesões em diferentes atividades pode ser explorada, fornecendo uma base teórica para orientar a prevenção de lesões, promovendo então a prevenção de lesões esportivas. **Resultados:** O estudo mostra que através dos métodos de treinamento profissional para melhorar a qualidade psicológica dos jovens boxeadores, esses esportistas também devem reconhecer a importância do treinamento psicológico. **Conclusão:** O auxílio técnico nessa abordagem pode completar o treinamento saudável, visando atender as exigências do esporte e colaborar para o alcance de melhores resultados. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** Psicologia; Boxe; Lesões Esportivas.

## RESUMEN

**Introducción:** El boxeo es un deporte de lucha, y hay muchos factores que provocan lesiones físicas en los deportistas debido al modo de competición y entrenamiento. Las lesiones son comunes para los atletas que suelen participar en este deporte. En base a esto, se debe explorar la relación entre la calidad psicológica positiva a nivel deportivo, proporcionando una base teórica para el cultivo de la personalidad optimista a los jóvenes atletas. **Objetivo:** Analizar las lesiones psicológicas en jóvenes boxeadores con el fin de fundamentar una norma para mejorar el sistema de evaluación de la calidad psicológica de los jóvenes atletas en China. **Métodos:** Al comparar las características de las diferentes lesiones, se puede explorar la posibilidad de que se produzcan lesiones en diferentes actividades, lo que proporciona una base teórica para orientar la prevención de lesiones y, a continuación, promover la prevención de lesiones deportivas. **Resultados:** El estudio muestra que, a través de los métodos de entrenamiento profesional para mejorar la calidad psicológica de los jóvenes boxeadores, estos deportistas también deberían reconocer la importancia del entrenamiento psicológico. **Conclusión:** La ayuda técnica en este enfoque puede completar el entrenamiento saludable, con el objetivo de cumplir con las exigencias del deporte y colaborar para lograr mejores resultados. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

**Descritores:** Psicología; Boxeo; Lesiones en Deportes.



## INTRODUCTION

Youth is a period of transition from individual physiology and psychology to maturity, and a critical period for the development of self-consciousness and world outlook.<sup>1</sup> In youth, self-concept, self-esteem and self-identity develop rapidly.<sup>2</sup> Sports can cultivate and strengthen people's values, but at the same time, it often instills a wrong value concept into people.<sup>3</sup> In competitive sports, various aggressive behaviors and other unethical behaviors occur frequently.<sup>4</sup> However, in view of the difference in understanding, the vast majority of coaches and athletes tend to have a concept of sports injury that causes damage to the body's muscle tissue, bones, and ligaments during exercise training and competition, and must be discontinued and treated.<sup>5</sup>

Boxing is not unfamiliar to us. It is a challenging and fierce sport. Corresponding athletes also need to bear all kinds of frustrations and difficulties in training and competition. It is easy to cause great pressure on the spirit and psychology.<sup>6</sup> Similarly, the publicity of information in modern society leads to well-known training theories and methods. Boxing is an antagonistic competitive sport with direct physical contact.<sup>7</sup> In such activities, highly developed special ability is an important factor to achieve good results. Good psychological qualities, such as good consciousness, psychological control ability and stable emotions, contribute to the improvement of boxing ability.<sup>8-10</sup> However, once the movement has a large damage, it is bound to hinder the athlete's career and future development. In the process of boxing, the punching power is large, and the glove protection is weak, the hand contusion is more common, and because the strength of the opponent's head is too heavy, it is easy to cause the other party to have a concussion.<sup>11</sup> It aims to promote the popularization and development of boxing, and to avoid boxing athletes from various injuries during sports training or competition.<sup>12</sup>

Young boxers in daily training, coaches in order to obtain better training results, will add some intensity in training is no less than the normal competition conditions of actual combat.<sup>13</sup> These conditional practical exercises will bring varying degrees of injuries to athletes' face and upper limbs in actual operation, and in general, these injuries are mostly closed nature.<sup>14</sup> Psychological quality refers to the ability to control the psychological quality in the face of external conditions and environmental interference.<sup>15</sup> Unreasonable technical movements, partial overburden and physical quality factors, and athletes' psychological instability are important reasons for the development of sports injuries.<sup>16</sup> In life, study and training, it is necessary to purposefully cultivate the healthy sentiments of young athletes, improve their technical skills and meet their spiritual and material needs. Much depends on the cultural education, ideological education and special technical level of education they receive.<sup>17-19</sup>

## Related Work

The DIT scores of college students and school athletes in the Department of Physical Education were significantly lower than those of students in the Department of General Education.<sup>20</sup> In the same year, Faude O et al. proposed competition in sports to reduce prosocial behavior and increase antisocial behavior. From another perspective, the competitiveness of sports determines that sports is not good for the moral development of the physically weak, especially special children, especially women.<sup>21</sup> Malina R M and others have long argued that situational factors can influence people's moral judgments and daily ethical behaviors. He called this situational influence a moral atmosphere.<sup>22</sup>

Gagnier J. J. and others argue that due to the limitations of methodology, the validity and reliability of empirical research on moral issues in sports field are questionable. Simply defining the complex multi-dimensional concept of morality as a person's moral cognitive ability is a kind of retrogression in itself.<sup>23</sup> The scores are mostly implemented by

referring to the standard scoring manual compiled by Kohlberg.<sup>24</sup> Do a good job in training women's athletes. Strengthen exercise training nutrition intervention; use flexible and effective training methods and means to scientifically and rationally arrange training load.<sup>25</sup>

## MATERIALS AND METHODS

With the development of competitive sports, the training system of youth competition has been constantly improved, and the coaching level of coaches has been improved more than before. More attention should be paid to the selection of training methods and the adjustment of load intensity. From a professional point of view, the factors affecting psychological development include physiological inheritance and educational environment. The norm parameters of the psychological quality sports items are shown in Table 1, and the athletes' psychological quality analysis chart is shown in Figure 1. The difference in positive psychological quality between young athletes with different physical fitness leading projects is extremely significant, especially in the dimensions of will, benevolence and transcendence. The psychological load has also increased relatively. If the psychological load exceeds the normal limit, it is easy to cause imbalance and disorder of various motor functions of the body, resulting in sports injuries.

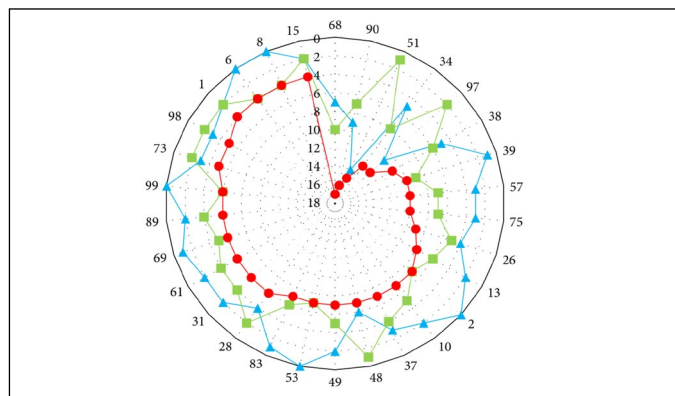
The study is Purely observational studies which no need to registry ID of ICMJE, and all the participants were reviewed and approved by Ethics Committee of Sichuan International Studies University, China (NO. 2021022)

Boxing is an intense sport in which athletes have direct physical contact. If they are hit by a heavy boxing, and the referee or assistant fails to take appropriate measures in time, they are prone to injury accidents. In boxing, head and face are the most common injuries. From Table 2 and Figure 2, it can be seen that sprain, abrasion and contusion are the main types of injury for Sanshou and boxers. Severe injuries such as fracture, dislocation and severe craniocerebral injury are relatively rare. The causes of sports injuries of boxers are shown in Table 3 and Figure 3. It is necessary to observe some details of the athletes' training process to prevent the athletes from causing a greater degree of damage to themselves or the other party's body due to the "fake excited" mood.

Boxing events are scored by hitting the front or side of the head or waist of the opponent directly at the peak of the boxing without obstruction. Therefore, the head is the main target of attack, and head and face injury is the most common injury in boxing. Hand injuries are second only to head and face injuries. Fist gloves are worn to hit

**Table 1.** Normal Parameters of Sports Events with Psychological Quality.

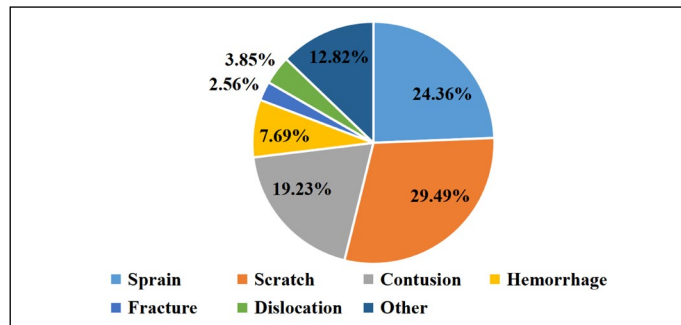
|                                | Test  | Parameter |
|--------------------------------|-------|-----------|
| Physical Fitness Leading Items | 15.06 | 9.32      |
| Skills-driven projects         | 13.09 | 9.65      |



**Figure 1.** Athlete psychological quality analysis chart.

**Table 2.** Types of sports injuries.

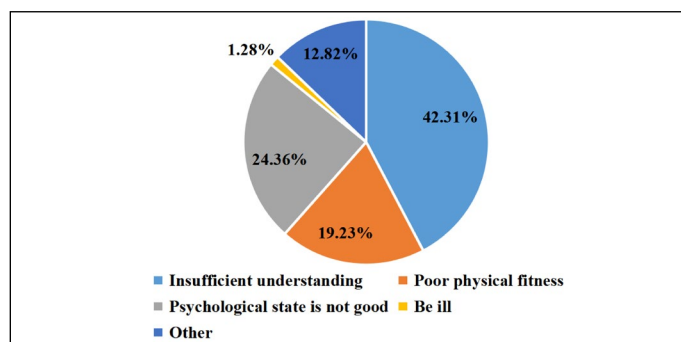
|             | Number | Percentage |
|-------------|--------|------------|
| Sprain      | 19     | 24.36%     |
| Scratch     | 23     | 29.49%     |
| Contusion   | 15     | 19.23%     |
| Hemorrhage  | 6      | 7.69%      |
| Fracture    | 2      | 2.56%      |
| Dislocation | 3      | 3.85%      |
| Other       | 10     | 12.82%     |



**Figure 2.** Types of sports injuries.

**Table 3.** Reasons for Sports Injury of Boxers.

|                                 | Number | Percentage |
|---------------------------------|--------|------------|
| Insufficient understanding      | 33     | 42.31%     |
| Poor physical fitness           | 15     | 19.23%     |
| Psychological state is not good | 19     | 24.36%     |
| Be ill                          | 1      | 1.28%      |
| Other                           | 10     | 12.82%     |



**Figure 3.** Reasons for Sports Injury of Boxers.

the opponent's athletes after bandaging or sandbag gloves are worn as the content of long-term training. The methods of psychological training are shown in Table 4 and Figure 4. Increasing the sample size can help to carry out more detailed analysis. For example, the subject-oriented project can be further divided into three groups of rapid strength, speed and endurance according to the item group theory. The skill-led projects are divided into five groups of performances that are difficult to be aesthetically pleasing, performance accuracy, network antagonistic, co-field confrontation, and combat confrontation, so as to obtain more detailed results and provide more targeted opinions for intervention.

## RESULT ANALYSIS AND DISCUSSION

Because the target of boxing competition is mainly controlled in the head, the phenomenon of slight brain concussion will be more common. In view of this phenomenon, we should also carry out targeted protective training in daily training. Among them, the training of skills should be strengthened, such as the training of hitting footsteps,

the training of dodging methods, the training of the position of the hand when fighting, and so on. It can also occur in subcortical, deep brain, brainstem and other parts. The victory or defeat is decided by the number of points obtained by the strike action in the prescribed time and the effect of attack and defence. The preventive measures for injury in boxing are shown in Table 5. Boxing training is shown in Figure 5. Of course, since the current Chinese boxing athletes wear helmets, teeth and guards during the competition, boxing gloves are also relatively thick and standard, and serious accidents or even deaths are rare. Most of the injuries that occur during training or competition are minor injuries.

For boxing events, it is found that there is no significant difference in the level of positive psychological quality between young athletes in physical dominant events according to the formula:

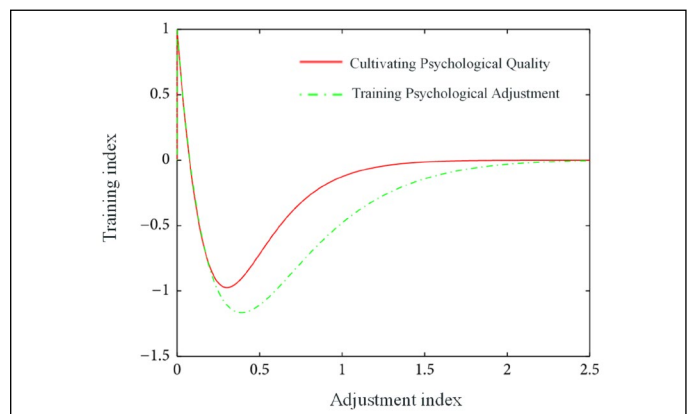
$$\frac{di}{dt} = \lambda \cdot s(t) \cdot i(t) \quad (1)$$

For the convenience of application, the formula can be used:

$$s(t) + i(t) = 1 \quad (2)$$

**Table 4.** The Method of Psychological Training.

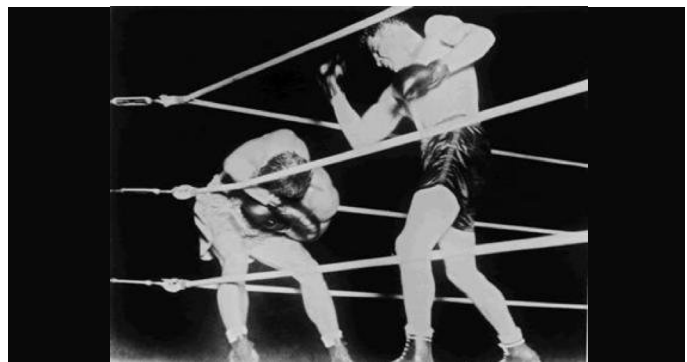
|                                   | Adjust | Train |
|-----------------------------------|--------|-------|
| Cultivating Psychological Quality | 5.06   | 4.12  |
| Training Psychological Adjustment | 4.92   | 5.17  |



**Figure 4.** The Method of Psychological Training.

**Table 5.** Preventive Measures of Injury in Boxing.

|  | Train     | Control   |
|--|-----------|-----------|
| Strengthening Correct Technical Action   | 8.19±0.32 | 5.24±0.90 |
| Strengthening Self-medical Consciousness | 7.43±1.50 | 8.13±0.41 |



**Figure 5.** Boxing competition training.

By calculating the mean and standard deviation, we can understand the overall situation of the positive psychological quality of our young athletes. Quantity of results obtained through inspection and calculation:

$$i(t) = \frac{1}{1 + \left(\frac{1}{i_0} - 1\right) \cdot e^{-\lambda t}} \quad (3)$$

$$t_{\max} = \frac{1}{\lambda} \ln\left(\frac{1}{i_0} - 1\right) \quad (4)$$

Model Analysis and Reliability Test of Psychological Structure Formula:

$$dR_i = \chi \cdot a(t) \cdot dt + \delta \cdot a(t) \cdot dw_i \quad (5)$$

$$dR_i^* = \xi \cdot a_x(t) dt + \zeta \cdot a_x(t) \cdot dw_i - dU_i^* \quad (6)$$

When using the structural formula model to examine the structure of a latent psychological variable, the observed variable usually considers the use of a combined entry instead of a single entry, according to the formula:

$$Y_i = \alpha + \sum_{j=1}^k \beta_j \cdot X_{ji} \quad (7)$$

After the continuous periodic waveform of the time domain is expanded, a series of discrete frequency components can be obtained in the frequency domain, and the psychological spectrum function of the periodic function is set:

$$u_i^\beta = y(m_1 + c) + (1 - y)m_1 = m_1 + yc \quad (8)$$

The continuous function  $m_2$  can be expressed as:

$$u_2^\beta = xm_2 + (1 - x)m_2 = m_2 \quad (9)$$

Approaching a finite value and becoming a continuous function, redefining it as:

$$F(x) = 1 / \sum (x_i - x_i^0)^2 \quad (10)$$

Turn a time function into a continuous function of frequency. Can be written as:

$$f(X) = \begin{cases} C_{\max} - \mu(X), & \mu(X) \leq C_{\max} \\ 0, & \text{other} \end{cases} \quad (11)$$

Get further conversions:

$$f(X) = \begin{cases} \frac{1}{1 + \mu(X)}, & 1 + \mu(X) \neq 0 \\ 0, & \text{other} \end{cases} \quad (12)$$

There are many factors causing boxer injury, among which psychological factors can not be ignored. Poor protective measures, physical fatigue and lack of adequate knowledge of injuries are also common reasons, which are closely related to athletes' training level and psychological factors. Through the will and thinking to regulate psychology, common can be through the convenience of meditation, such as self-compiled phrases repeated in the heart, alleviate anxiety. The latter can be a hint from teammates and coaches, whose intonation, expression, gesture and so on will have a great impact on the young people in the game, making it used for confidence and strength. The influence of athlete personality characteristics is shown in Figure 6. Then the requirements for psychological traits should be different. It is not surprising that the various sports are mixed together and it is hoped that a general relationship between positive psychological quality and athletic grades will be found. The motivation of sports achievement is a factor to ensure that athletes achieve good results in the competition. The higher the motivation of sports achievement, the more likely it is to achieve good results. However, it also affects the moral judgment and moral behavior of athletes.

In view of the high injury rate of boxers, it is necessary to strengthen the training of the vulnerable parts, especially the head and hands, to help improve the protection ability and reduce the damage degree of the weak parts. In boxing competitions, the athletes hold the fist in the front hand and the other hand in the back. They are called forehand fist and backhand fist respectively. Backhand fist is the main strength of the athletes. The fist is fierce, powerful and explosive, and the reaction force they bear after hitting is also great. In the protection training of finger, wrist and joint ligament, it is necessary to train the stability of joint and strengthen the exercise of muscle around finger, wrist and joint ligament. The quick response means avoiding the opponent's hit. At the same time, wisdom and talents accelerate the thinking and improve the efficiency of thinking. The effect of strength comparison and training level is shown in Figure 7. Followed by representation training. The emotional instability in boxing matches occurs when the athletes feel that the brain is completely blank and unable to concentrate on thinking.

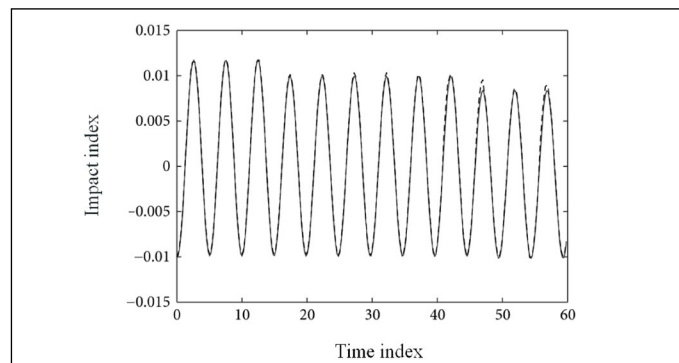


Figure 6. The Influence of Athletes' Personality Characteristics.

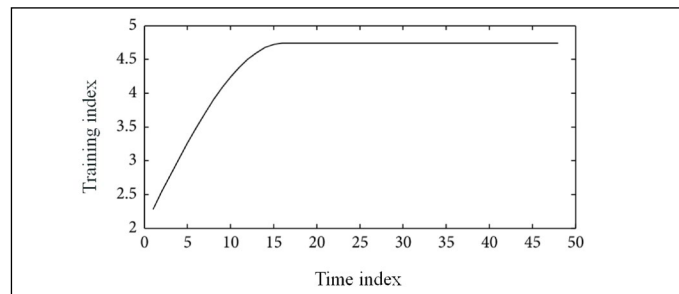


Figure 7. The Influence of Strength Contrast and Training Level.

## CONCLUSION

In this paper, the characteristics of sports injury of young boxers caused by psychological injury factors are analyzed. With the development of the research on the positive psychological quality of young athletes in the future, the next step is to develop intervention programs for different positive psychological qualities. In the end, the evaluation results can be put into practice, which can play a practical role in bringing the potential of young athletes into full play and promoting their talents. Sports competition is a kind of intense exercise with high intensity and heavy load. It requires more mental and physical aspects than any other activity. If we can actively make our mental and physical state in a moderate level of excitement, it will be conducive to play their best level, but also to minimize sports injury. Through the discussion of the common sports injuries and preventive measures of young boxers,

it can be found that the boxing athletes are in the process of training and competition. The damage suffered is basically tissue contusion or ligament strain. These injuries are large and small, and the recovery time required is also different. In order to prevent the former training mobilization from being subjected to a large degree of sports injury during the competition, the coach should provide scientific guidance on the athlete's operation technique and the range of motion. At the same time, young boxers should develop self-protection awareness during the training process, especially in competitions or daily training. Taking corresponding preventive measures against the above factors is of great significance to avoid the occurrence of sports injuries.

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

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## REFERENCES

1. Kemler E, Vriend I, Paulis WD, Schoots W, van Middelkoop M, Koes B. Is overweight a risk factor for sports injuries in children, adolescents, and young adults?. *Scand J Med Sci Sports*. 2015;25(2):259-64.
2. Straccolini A, Casciano R, Levey Friedman H, Meehan WP 3<sup>rd</sup>, Micheli LJ. Pediatric Sports Injuries: An Age Comparison of Children Versus Adolescents. *Am J Sports Med*. 2013;41(8):1922-9.
3. Bailey D, Jones D, Sinnott A, Brugniaux JV, New KJ, Hodson D, et al. Impaired cerebral haemodynamic function associated with chronic traumatic brain injury in professional boxers. *Clin Sci (Lond)*. 2013;124(3):177-89.
4. van der Sluis A, Elferink-Gemser MT, Coelho-e-Silva MJ, Nijboer JA, Brink MS, Visscher C. Sport Injuries Aligned to Peak Height Velocity in Talented Pubertal Soccer Players. *Int J Sports Med*. 2014;35(4):351-5.
5. Nassib S, Moalla W, Hammoudi-Nassib S, Chtara M, Hachana Y, Tabka Z, et al. The IGF-1/cortisol ratio as a useful marker for monitoring training in young boxers. *Biol Sport*. 2016;33(1):15-22.
6. Gall FL, Carling C, Reilly T. Injuries in Young Elite Female Soccer Players. *Am J Sports Med*. 2017;36(2):276-84.
7. Siewe J, Rudat J, Zarghooni K, Sobottke R, Eysel P, Herren C, et al. Injuries in Competitive Boxing. A Prospective Study. *Int J Sports Med*. 2014;36(3):249-53.
8. Wilson G, Pritchard P, Papageorgiou C, Phillips S, Kumar P, Langan-Evans C, et al. Fasted Exercise and Increased Dietary Protein Reduces Body Fat and Improves Strength in Jockeys. *Int J Sports Med*. 2015;36(12):1008-14.
9. Ranson C, Peirce N, Young M. Batting head injury in professional cricket: a systematic video analysis of helmet safety characteristics. *Br J Sports Med*. 2013;47(10):644-8.
10. Steffen K, Moseid CH, Engebretsen L, Sjøberg PK, Amundsen O, Holm K, et al. Sports injuries and illnesses in the Lillehammer 2016 Youth Olympic Winter Games. *Br J Sports Med*. 2017;51(1):29-35.
11. Ranson C, Young M. Putting a lid on it: prevention of batting helmet related injuries in cricket. *Br J Sports Med*. 2013;47(10):609-10.
12. Mari Leppänen, Pasanen K, Krosshaug T, Kannus P, Vasankari T, Parkkari J. Landing with Less Hip Flexion Is Associated with Increased Risk of Acl Injuries in Young Female Team Sports Players. *Br J Sports Med*. 2017;51(4):350.1-350.
13. Cho YJ, Na YM, Jung HS, Lee SY. One-Year Follow-Up Prospective Epidemiological Study of Injury Types in The Korea Ladies Professional Golfers, 2015 Season. *Br J Sports Med*. 2017;51(4):307.2-307.
14. Kox LS, Kuijjer PPFM, Opperman J, Kerkhoffs GMMJ, Maas M, Frings-Dresen MHW. Overuse wrist injuries in young athletes: What do sports physicians consider important signals and functional limitations?. *J Sports Sci*. 2018;36(1):86-96.
15. Oshlag BL, Ray TR. Elbow Injuries in the Young Throwing Athlete. *Curr Sports Med Rep*. 2016;15(5):325-9.
16. Swenson DM, Collins CL, Fields SK, Comstock RD. Epidemiology of US High School Sports-Related Ligamentous Ankle Injuries, 2005/06-2010/11. *Clin J Sport Med*. 2013;23(3):190-6.
17. May MM, Bishop JY. Shoulder injuries in young athletes. *Pediatr Radiology*. 2013;43(1):135-40.