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Original article

Effect of mental toughness training on performance strategies and performance level of complex skills for youth epee fencers

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Abstract

Purpose. Mental toughness is one of the most important and necessary requirements in any sporting activity. Without this, we can hardly talk about a successful athlete despite a good technique and physical preparation and rather we will talk about an average athlete or suddenly good, but who will not go further or stand out. This point is one of the fundamental ones to work on the psychological preparation of every athlete in general, but especially in the competitive and even more, the elite and in turn, it is one of the most difficult to achieve. The aim of this study was to investigate the effectiveness of mental toughness training on performance strategies and performance level of complex skills for youth Epee fencers.

Methods. The sample were (18) youth Epee fencer, and (8) fencers were excluded from them to conduct the exploratory study on them, so that the total sample became (10) youth Epee fencer, The data collected before - after the training programs for the experimental group.

Results. Statistical analyses showed that:

- Significant Difference between the Pre-posttests for the experimental Group in all determinants of Sports Mental Toughness Questionnaire for posttest.
- Significant Difference between Pre-posttests for the experimental Group in Competition Determinants (Goal Setting, Self-Talk, Relaxation, Emotional Control, Imagery, Negative Thinking) for posttest.
- No -Significant Difference between Pre-posttests for the experimental Group in Competition Determinants (Automatically, Activation)
- Significant Difference between Pre-posttests for the experimental Group in Training Determinants (Goal Setting, Emotional Control, Imagery, Attentional Control) for posttest
- No -Significant Difference between Pre-posttests for the experimental Group in Training Determinants (Self-Talk, Relaxation, Automatically, Activation)
- Significant Difference between the Pre-posttests for the experimental Group in performance level of complex skills for posttest.

Conclusions. Under the conditions of this article, the researcher conclusion that eight weeks of mental toughness training contributed to improving performance strategies and performance level of complex skills for youth Epee fencers.

Key words: Mental Toughness, Performance Strategies, Epee.

Introduction

The nature of the high levels of sports requires the athlete to use his physical, skill, tactical and psychological capabilities in an integrated manner to try to achieve the best possible level.

The methods and principles of physical, skill and planning preparation have converged to a large degree in recent years, so there has been a need for more attention to the psychological aspect.

Osama Ratib (2000) indicates that sporting excellence depends on the extent to which players benefit from their psychological capabilities in a way that is no less than the benefit from their physical capabilities. Psychological abilities help individuals mobilize their physical abilities and energies to achieve maximum and best athletic performance.

Al-Arabi Shamoun (1996) indicates that the development of psychological skills should go hand in

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hand with the development of the elements of physical fitness through long-term programs and should focus on them as is the case in the basic skills of various sports activities.

Beth Athanas, (2006) believes that psychological skills play a key role in the development of performance and have become seen as one of the basic requirements that must be taken care of along with the physical, skill and planning requirements. Which determines the outcome of the fencers during the competition, which plays a major role in achieving victory.

John Heil, et al. (2004) to the need to prepare the fencer to compete by mobilizing his energy to the maximum level, as psychological skills play the largest role during competition.

Mental toughness is one of the most important and necessary requirements in any sporting activity. Without this, we can hardly talk about a successful athlete despite a good technique and physical preparation and rather we will talk about an average athlete or suddenly good, but who will not go further or stand out. This point is one of the fundamental ones to work on the psychological preparation of every athlete in general, but especially in the competitive and even more, the elite and in turn, it is one of the most difficult to achieve.

It is one of the most used concepts currently by journalists, commentators, or others, however, it is a much more complex psychological construct than could be imagined and is, in addition, one of the most difficult points to achieve and consolidate for athletes. Mental ability can allow an athlete with lower aptitudes and physical abilities than his opponent to achieve victory.

Gould, et al. (2002) indicated that mental toughness is the most important thing in achieving athletic achievement.

And Jimes Loehr, (1993) adds that coaches and athletes confirm that psychological skills that reflect mental toughness contribute at least 50% to achieving athletic achievement.

According to Simon Middleton et al. (2004) indicates that it is the maximum natural or developed psychological level that we can reach, and it gives athletes the ability to endurance compared to their competitors during sports competition, training, or lifestyle, through the development of focus, confidence, and stability under pressure.

Jolly Ray, (2003) points out that mental toughness is the ability to maintain perfect performance when the pressures of competition intensify, and this requires good technical and psychological skills. In addition, the instability of performance during competitions is primarily due to psychological variables, which come in the forefront of the determinants of mental toughness.

Jones, et al. (2002) argue that mental toughness is the natural psychological edge that enables a fencer to perform steadily and better than his or her competitors while retaining confidence, flexibility, control, focus and determination under pressure.

According to John Lefkowits, et al. (2003) indicated that mental toughness means reaching the ideal and maximum performance, regardless of the conditions of competition.

He adds that mental toughness problems can be easily detected in the sports field, especially among fencers, as they appear clearly by recording successive touches outside the authorized touch area, or passing touches, or by conducting many successive attacks in the same manner and are thwarted by the competitor, through a lot of talking With judgment when analyzing the kinetic sentence, and through the above, we can determine the extent to which the fencers lack mental toughness.

Danek Nowoskisk, (2007) explains that the large number of stops during one fight, in addition to the large number of matches played by the fencer in one day, the average number of matches played by the fencer ranges from 4-5 matches, ending with the decisive match, which is the final match, and the fencer must face All of these variables maintain the stability of his performance, depending on the extent of his mental toughness.

This is confirmed by Ibrahim Nabil (2001) that the sport of fencing requires the mental aspect to a greater extent than the physical aspect, as the mental aspect plays the largest role in fencing, so the fencer must be characterized by a high degree of willpower, patience, control of emotions and the ability to act as he There is no room for hesitation.

The strategy is to identify the best way to reach the goal and get there by exploiting strengths and overcoming weaknesses.

Aldo Nadi, (1994) agree on the need for the fencer to develop his performance strategies through mental and psychological training, as the excitement and fun in fencing is due to the unilateral thinking on the ring.

They add that fencing is a mental fight before it is a motor fight, and therefore it depends on mental toughness and the rules of self-control.

The Australian Fencing Federation (2007) indicates that performance strategies in fencing are to work to create all conditions to maintain a constant control of attention towards achieving the goal.

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Jolly Ray, (2003) sees that performance strategies in fencing depend on muscle strength and the rules of self-control. In fact, it is a hidden mental adventure. The choice of timing for the attack is the most influential factor on the competitor, as the psychological threat has a greater effect than the threat of weapons.

The reality refers to the interest of coaches and all workers in the physical, skill and planning aspects without any consideration of psychological skills, although sports performance in general depends on the player's physical, skill, planning and psychological skills as well.

From the foregoing we note that the nature of high sporting levels requires the athlete to use his physical, skill, tactical and psychological capabilities to the maximum possible degree to try to achieve the best possible level, with a focus on psychological skills as they represent an important dimension in the psychological preparation of fencers.

The idea of the research crystallized in the researcher's mind through his observation of the huge differences in the levels of performance between the international levels and the Egyptian levels in the sport of fencing, although the style and techniques of performance may be close. Here, the researcher raised a question about the reasons for this gap, which may be the result of our fencers' lack of some variables that affect performance, which may be a lack of psychological skills. The researcher noticed that internationally ranked fencers usually play matches with high stability and are not affected by the pressures of competition or the nature and importance of matches.

Based on the foregoing, the aim of this study was to investigate the effectiveness of mental toughness training on performance strategies and performance level of complex skills for youth Epee fencers.

Methods

The sample (18) youth Epee fencer, and (8) fencers were excluded from them to conduct the exploratory study on them, so that the total sample became (10) youth Epee fencer, The data collected before - after the training programs for the experimental group. The researcher conducted homogeneity in height, weight, chronological age, and training experience, Table No. (1) illustrates this.

Statistical analysis

The researcher used SPSS statistical package version 22.

- Means
- standard deviations (SD).
- Student's t-test
- Confidence intervals (± 95%).

Table 1. Characteristics of experimental group (Mean ± SD)

Group	N	Age [years]	Weight [kg]	Height [cm]	Training experience[years]
Experimental	10	15.31 ± 0.6	70 ± 4.8	173 ± 2.91	6.05 ± 1.2

Table 1 shows characteristics of experimental group. There were no significant differences were observed in the variables.

Complex skill test

Move forward by hitting the blade and then lung. (Frequency in 30 seconds)

Psychological tests:

1 -The Sports Mental Toughness Questionnaire:

The researcher applied the Sports Mental Toughness Questionnaire (SMTQ) by Sheard, et al. (2009). prepared and translated it to Arabic language by the researcher, which includes (3) psychological determinants:

1- Confidence
2- Constancy
3- Control

The test includes (14) phrases, and each determinant is represented by a number of phrases, the confidence determinant is represented by (6) phrases with numbers (1, 5, 6, 11, 13, 14), and the determinant of stability is represented by (4) phrases with numbers (3, 8, 10). , 12), and the control determinant is represented by (4) phrases with numbers (2, 4, 7, 9) and the fencer answers the test phrases on a four-degree scale (Likert scale), the fencer gets (4) degrees if the phrase is true, (1) degree if the phrase is not true.

2- Performance Strategies Test:

The researcher applied the Test of Performance Strategies (TOPS) by Thomas et al. (1999) to measure the psychological skills of sports performance, after preparing and translated it to Arabic language by the researcher, and it includes (8) determinants of competition and (8) determinants of training:

Competition determinants:

Activation.
Automatically.
Emotional Control
Goal Setting
Imagery
Negative Thinking

Relaxation
Self-Talk

Training determinants:

Activation.
Automatically
Emotional Control.
Goal Setting
Imagery
Attentional Control
Relaxation
Self-Talk

The test includes (64) phrases and each dimension of the sixteen dimensions previously explained is represented by (4) phrases, with (32) phrases for the determinants of competition, (32) phrases for the determinants of training, and the fencer answers the test phrases on a five-degree scale (Likert scale), the fencer gets (5) degrees if the phrase is true, (1) degree if the phrase is not true.

The foundations of the proposed training program:

The aim of the program:

The program aims to develop mental toughness and self-concept of athletic talent.

Program dimensions:

- Building self-confidence
- Always think like a winner
- Positive self-talk
- mental visualization
- Performance steadily under pressure
- Attention and focus

Program preparatory steps:

- Classification of psychological skills
- Determine the proposed total time for the unit
- Determine the time of each unit
- Determining the content of relaxation exercises
- Determining the timing of relaxation exercises

Foundations of the program:

- Considering individual differences
- Continuity of training
- Do not rush to move from one stage to another
- Considering the arrangement and hierarchical composition
- Consider the specific conditions of the application
- Determining the total time of the program:

Through the reference survey for studies and research, the researcher determined the duration of the training program for the research sample at (10) weeks, and the period was as follows:

- The time for applying the training program is (10) weeks.
- Number of weekly training (3) units.
- The training unit time is 30 minutes and starts immediately before the physical warm-up

Results.

Table 2. Differences significant between the Pre-posttests for the experimental Group in Sports Mental Toughness Questionnaire

Variables	Pre	Post	Sign.
Confidence	18.40 ±2.22	21.11 ±3.23	S
Constancy	11.70 ±2.92	14.18 ±2.75	S
Control	10.35 ±3.08	13.15 ±3.11	S

Table 2 shows that:

Significant Difference between the Pre-posttests for the experimental Group in all determinants of Sports Mental Toughness Questionnaire for posttest.

Table 3. Differences significant between the Pre-posttests for the experimental Group in Performance Strategies Test

Variables	Pre	Post	Sign.
Competition Determinants			
Goal Setting	12.32 ±2.92	15.28 ±3.11	S
Self-Talk	13.35 ±3.08	16.15 ±3.11	S
Relaxation	12.27 ±2.89	14.53 ±2.93	S
Automatically	10.42 ±2.64	11.00 ±2.29	NS
Activation	11.55 ±2.84	12.70 ±2.91	NS
Emotional Control	12.11 ±2.82	14.64 ±3.00	S
Imagery	13.32 ±2.42	16.22 ±3.08	S
Negative Thinking	12.32 ±2.92	15.28 ±3.11	S
Training Determinants			

Goal Setting	12.50 ±2.33	14.67 ±2.87	S
Self-Talk	12.62 ±2.82	13.47 ±2.43	NS
Relaxation	11.45 ±2.63	12.27 ±2.34	NS
Automatically	10.00 ±2.51	11.21 ±2.30	NS
Activation	11.78 ±2.65	12.94 ±2.74	NS
Emotional Control	12.44 ±2.37	14.88 ±3.15	S
Imagery	13.41 ±2.42	17.14 ±2.36	S
Attentional Control	11.74 ±2.54	14.28 ±3.21	S

Table 3 shows that:

Significant Difference between Pre-posttests for the experimental Group in Competition Determinants (Goal Setting, Self-Talk, Relaxation, Emotional Control, Imagery, Negative Thinking) for posttest.

No -Significant Difference between Pre-posttests for the experimental Group in Competition Determinants (Automatically, Activation)

Significant Difference between Pre-posttests for the experimental Group in Training Determinants (Goal Setting, Emotional Control, Imagery, Attentional Control) for posttest

No -Significant Difference between Pre-posttests for the experimental Group in Training Determinants (Self-Talk, Relaxation, Automatically, Activation)

Table 4. Differences significant between the Pre-posttests for the experimental Group in performance level of complex skills

Variables	Pre	Post	Sign.
performance level of complex skills	22.40 ±2.22	25.11 ±3.23	S

Table 4 shows that:

Significant Difference between the Pre-posttests for the experimental Group in performance level of complex skills for posttest.

Discussion.

The researcher believes that this is due to the difference in the calculation of touch registration in the fencing weapon from the fencing weapon and the sword weapon, as the double touch is calculated for both fencing in the fencing weapon, while in the Sabre weapon and Foil weapon, the calculation of touches is done in the light of the analysis of the jousting sentence, to calculate the touch.

Therefore, the Epee fencer's motivation increases in performance with the maximum effort to score a touch.

In addition to the influence of the motivation levels of the fencers with specific motives, and this effect varies from one fencer to another, some of them respond better when they hear the coach's instructions to them or incite them to make the effort, granting rewards or changing the players' positions in the game plan or assigning the athlete a certain responsibility, or directing Punishment or warning him, all of which are methods that can be used with athletes, so it is preferable to identify the personality and nature of the athlete so that we can choose the appropriate means of motivation to use when needed without resorting to putting all members of the group under the same treatment.

In this regard, John Heil, et al. (2004) that each of the three weapons has special psychological requirements that distinguish it from the rest of the other two weapons. A fencer who lacks positive psychological traits will not be able, regardless of his abilities and physical and technical levels, to achieve the highest levels.

It agrees with what Beth Athanas, (2006) stated that the degree of motivation of the fencer is greatly affected by the extent of his confidence in his ability and talents. He makes the effort and hard work that enables him to achieve the goal.

The results of the study agree with Wafaa Darwish (1997) that sword fencing has outperformed fencing and archer fencers in terms of achievement motivation and self-confidence.

The researcher attributed this to the different nature of the recording of touches and the performance time played in the three weapons. The average performance time played in the sword weapon is 1.54 minutes, in the blind weapon 6.09 minutes, and in the fencing weapon 7.29 minutes.

Therefore, swordsmen are characterized by directional control so that they can record touches at a high speed.

In this regard, Beth Athanas, (2006) confirms that controlling the direction gives the fencer positive thinking and quick decision-making at all times of the fight.

This is consistent with what Al-Arabi Shamoun (1996) stated that the level of performance is one of the most important factors that must be taken care of when developing psychological skills programs, as the level of performance varies according to the classification of players considering experience and the number of years of practice and stresses the importance of convergence in the level of performance to achieve the required interaction.

Osama Ratib (2000) points out that the highly emotional player appears to be below his true potential.

Beth Athanas, (2006) indicates the importance of setting a goal for the fencing player, as it is the basis when developing a psychological training program because setting the goal is immediately followed by working to achieve this goal with motivation, self-confidence, and determination to achieve it. The player who aims to improve his physical fitness must train seriously to achieve this goal.

He adds that the fencing players' goal-setting strategy can be developed through mental toughness training.

Elaraby Shamoun (1996) explains that relaxation leads to reducing the effect of the stress response and helping to reach the optimal level of tension and preventing the accumulation of stress by working to reach a low level of basal tension and reach a degree of deep relaxation in which the level of tension is lower than the basal level.

And Beth Athanas, (2006) indicates that negative thinking is one of the important psychological features of the fencing player, bearing in mind that the fencing player will not be able to distance himself from the negative thoughts, especially that he has during the competition, but he can make them not overcome him. and affect his performance James Lowther, (2002) indicates that positive self-talk is positively correlated with the outcome of matches in fencing.

He adds that self-talk clearly reflects the level of self-efficacy, which means I can or cannot perform.

The researcher believes that self-talk is one of the requirements for fencing, as self-talk is a vital dimension in the fields of training and competition at all levels, and the athlete's ability to employ positive self-talk is one of the decisive factors that directly affect the performance of various sports skills.

This is supported by what Al-Arabi Shamoun (1996) stated that the occurrence of sporting achievements is linked to the presence of the player in the optimum psychological energy zone.

This is confirmed by Daniel & Marcus, (2003) of the existence of differences between the privileged and non-distinguished players in emotional control, negative thinking, and mechanism in performance strategies for competition, emotional control, and mental visualization in performance strategies for training, and the presence of differences between male and female players in the total determinants of special performance strategies by competition.

These results constant with Naglaa Elbadry, et al. (2017) that measuring the mental toughness of the Egyptian athletes adapted to Egyptian environment and helping coaches, sports psychologists and interested in assessment.

Conclusions

Under the conditions of this article, the researcher conclusion that eight weeks of mental toughness training contributed to improving performance strategies and performance level of complex skills for youth Epee fencers.

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