### APPLICATION OF ATSMS QUESTIONNAIRE TO ASSESS THE PSYCHOLOGICAL STATE AFTER TRAINING OF UNIVERSITY STUDENTS\*

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In modern sports, besides tactics, techniques and physical strength, psychological factors play an important role in training and competition results. The psychological state of training, whose main components are motivation and emotion to be very diverse in terms of nuances and intensity. It can help the practitioner feel excited, confident, full of energy and agile. On the contrary, it can also make the practitioner feel unconfident, stressed, anxious or depressed; reactions become sluggish and slow; coordination becomes disturbed. With the influence of psychological states on the training efficiency of the trainee being so great, it has become an issue that sports psychology is very interested in researching. The application of the ATSMS questionnaire to assess the psychological state after training of shooting students on the MBT03 shooting machine at Ho Chi Minh City University of Technical Education aims to add more evidence to prove that psychological factors play an important role in training and competition results.

**Keywords:** ATSMS Questionnaire; Psychology; After training; Ho Chi Minh City University of Technical Education.

#### 1. Introduction

In a narrow sense, sports training is "an organized educational process that maximizes a person's physical and mental potential to achieve excellent performance". In a broader sense, sports training is "the entire process of preparing an athlete to create and maintain the highest level of sports performance". Some experts also define sports training concept as "a planned, purposeful sports activity under the direction of a coach to improve performance and sports performance".

Corresponding to the research using the ATSMS questionnaire, however the research subjects are different, as well as the time and characteristics of applying the questionnaire are different, so there will be different psychological states or characteristics of the subjects. Based on the requirement to improve the effectiveness of shooting student training and contribute to improving the understanding of the post-training state of shooting students, so conducting the research "Application of ATSMS questionnaire to assess the posttraining psychological state of shooting students on the MBT03 shooting machine at Ho Chi Minh City University of Technical Education" is very necessary, suitable for current practice.

#### 2. Research overview

In Vietnam today, research on sports psychology is still very limited, with very few published researchs, only a few initial breakthrough researchs, such as: Research on attention concentration ability in young table tennis players aged 11-12 and 13-14 in Ho Chi Minh City (Quang, 2011); Research on negative psychological states before Karatedo competitions (Huong, 2007); Research on some measures to adjust the psychological state before competition of young Taekwondo athletes in Binh Thuan province, age 15-17 (Binh, 2006); Research on the application of POMS questionnaire to assess the psychological state before competition of traditional martial arts athletes in Dong Nai province (Phat, 2015); Psychology Collection (Hac, 2002); Sports Psychology Consulting Handbook (Toan, 2002); Sports athlete psychology (Vien & colleagues, 2014); Research on the application of ATSMS questionnaire to assess the post-training status of athletes of the Vietnam traditional martial arts team in Dong Nai province (Hanh, 2017),... In which, only the study of author Le Thi My Hanh mentioned the post-training state of Vietnamese traditional martial arts athletes, therefore there has been no research on the post-training state of

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shooting students on the MBT03 shooting machine.

For the research of author Vu Viet Bao (2013), the research was on the characteristics of anxiety disorders of Karatedo athletes in Ho Chi Minh City, the author translated and provided 15 questions to assess the anxiety disorder status of Karatedo athletes through the SCAT assessment, the research assessed the level of anxiety in three levels: mild, moderate and severe in the research subjects.

As for Research on applying POMS questionnaire to assess the psychological state before competition of Traditional Martial Arts athletes in Dong Nai province (Phat, 2015), the research identified 40 questions corresponding to states including stress, anger, fatigue, depression, enthusiasm - strength, panic and self-related emotions.

For the research on *Research on the application* of ATSMS questionnaire to assess the post-training status of athletes of the Vietnam Traditional Martial Arts team in Dong Nai province (Hanh, 2017), it is also to assess the psychological manifestations of athletes with the identification of 45 questions corresponding to 8 psychological states including: (1) Feelings of stress; (2) Feeling good; (3) Fatigue; (4) Personal performance; (5) Personal regulation; (6) Physical recovery; (7) Mental exhaustion; (8) Mental fatigue.

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Based on the requirement to improve the effectiveness of shooting student training and contribute to improving the understanding of the post-training state of shooting students, conducting the study "Application of ATSMS questionnaire to assess the post-training psychological state of shooting students on the MBT03 shooting machine at Ho Chi Minh City University of Technical Education" is very necessary, suitable for current practice.

#### 3. Research methods

The research used the Chinese version presented in the document, as: 张力为(2009),体育科学 常用心理量表评定手册。北京体育大学出版 (Zhang Li Wei (2009)), *Handbook of commonly used psychological assessment questionnaires in sports science* (Beijing Sport University Publishing house).

The questionnaire has 45 questions with 07 levels of choice (from 0 to 6) corresponding to never (0 to less than 2); sometimes (2 to less than 4); often (4 to less than 6); and always happens (6), including 8 important components for psychological assessment, including 4 positive state components

and 4 negative components, which are:

- Emotional distress: Measures the frequency of negative moods.

- Good Feeling: Refer to a good state of physical and mental well-being.

- Fatigue: Level of physical fatigue.

- Personal performance: Desired level of personal performance.

- Personal regulation: The situation of using psychological abilities when preparing for training or competition.

- Physical recovery: Situation of physical recovery.

- Mental exhaustion: Including desire loss for activity; physical and mental exhaustion; decreased self-esteem; mood changes; changes in values and beliefs; feelings of isolation.

- Mental fatigue: It is very difficult for the practitioner to maintain a normal training state to achieve results.

#### 4. Research result

## 4.1. The relationship between sports training and the selection of talented athletes

The competitive ability of athletes includes two parts, one is the athlete's genetic and innate ability; the other is the accumulation and exploitation, improving the premise ability of sports training. Poor selection of sports talent will not create a foundation for sports training; conversely, poor and unscientific sports training will not be able to exploit hidden talents to train them into excellent sports athletes. In the process of forming sports training science from the practical requirements of training and educating sports talents, sports training science was formed with specialized fields such as the theory of sports competition initiated by Matveev (former Soviet Union) on high-level competitive sports, in which the main issues are:

(1) Competitive sport has the goal of achieving the highest sporting achievement.

(2) The special social function of high performance sport.

(3) The standard function of sports competition in which the special criterion of socio-economic and cultural value is the record of achievements that people achieve.

(4) The function and impact of performance sport are as great as its reward value.

(5) Social interaction function.

(6) The socialization function whose nucleus has individual talent attributes.

In order to have high-performance sports with valuable human-created talent, people must have the following conditions:

(1) There must be athletes with outstanding natural talent.

(2) There must be talented people with the motivation to achieve high and the highest sports achievements, to try their best with the highest will, voluntarily devote all one's mind to a profession as a profound profession.

(3) There must be scientific and technical guarantees as well as high quality for a professional talent training system with a team of specialized sports athletes.

Stimulation that create an impact on the human biological body cause a phenomenon that Janos Selye (Hungarian origin) calls stress. Stress in sports is the stress caused by the amount of training and competition that creates a monomorphic reaction consisting of 3 stages:

(1) The first box stress multiplication stage.

(2) The reaction phase is immune and physical.

(3) The decline phase due to excessive stress causes exhaustion. The origin of this third phase is due to Janos Selye's exhaustion of energy.

The three stages of stress represent adaptation in the form of cyclical and limited waves that are natural not only to humans. From Janos Selye, there are two types of adaptive energy (external, easily recognizable and recoverable and internal, with a potential working reserve to supplement the energy generated by consumption during work but mainly after work). Later, biomedical experts divided energy into 3 types, from which they divided biological energy reserve functions into 3 types:

(1) The functional type changes from static to dynamic state of biological reserves with synthetic anabolic reactions predominating.

(2) The functional type of biological reserves is to balance the reactions of two types, anabolism and catabolism (decomposition).

(3) This type of biological reserve function is activated under stress (high stress) and requires a very high total value.

After in-depth research in life through biomedicine, psychology, the adaptation process is divided into 4 stages:

(1) Emergency stage: when the body's function exceeds the maximum level, it is impossible to save energy when consuming the energy reserves of each organ with stress causing a reaction, thus falling into a serious state of harm due to difficulty in control. At this time, there is no change in the function or morphology of the organ system.

(2) Transitional phase: long-term adaptation to rapid, positive changes in morphological function such as genetic activation of cell structure, increased functional capacity of the organ system that is being affected, as well as the diffusion and transfer of influence to related organs, synthesis of constituent elements in biological structure such as ambumins, nucleic acids,... the effects that cause traces in the body are not concentrated yet and have not yet been linked into a system, meaning that the body is adapting itself through the emergency phase and is adapting itself (gradually forgetting).

(3) Stabilization phase: the body's stress response gradually decreases depending on the level of forgetfulness > structural changes in the body adapt and gradually develop, thereby improving system function, ensuring stable operation and gradual savings.

The process of forming the above traces is stable in structure, changing the morphology and function gradually due to the gradual familiarization with the stimulation and the gradual adaptation law.

(4) Refractory period: when stress intensity increases, the stress response suddenly increases, disrupting the normal stress response pattern. The most important biological nature of evolution is that humans are shown in their immune capacity. There are natural immune capacities and adaptive immune capacities that form new dominant forms in biological bodies. The biological adaptation process is divided into four stages: the mobilization stage mobilizes immune reserves to respond to residual stress. Recovery phase: the body's existing immune defenses against stress are maintained. The recovery stage of decline is the second stage of decline when the body continues to suffer from high-intensity stress caused by a weakened immune system, even a sharp reduction or paralysis of the immune system's functions. Recovery phase: refer to the gradual recovery of the body's immune and hormonal state when stress is reduced.

## 4.2. Psychological state after training of shooting students on MBT03 shooting machine

The psychological state of an athlete reflects the content of activities and the interaction of psychological factors in each individual in the world of sports. Mood always affects and impacts the performance of each individual in specific circumstances.

#### 4.2.1. The concept of stress mood

Stress is one of the typical manifestations of stress that reflects the psychological state and levels of energy and capacity response from normal to possible exhaustion to solve tasks and impacts from external or internal circumstances of the active subject. According to Arunjot Singh in stress and sports performance, stress can be defined as a physical, mental or emotional demand that tends to alter the body's homeostasis. Stress is the result of any type of pressure (it can be due to work, school, illness, marriage,...).

Maximum effort to meet energy: Energy is the source of vitality that helps the body function. Physical energy to ensure satisfaction for the body's vital activities. Spiritual energy is intended to ensure satisfaction of the activities of spiritual life. If the spirit is depressed, no matter how strong the physical energy responses are, one feels weak and unable to do anything. What we call will, desire, longing... are all spiritual energies.

When increasing the amount of exercise with high intensity, the subject must respond to energy by increasing energy response by increasing anaerobic metabolism, leading to increased blood lactic acid (possibly from 12-25mmol/L), causing serious endothelial instability in the direction of acidosis, decreased pH, increased water and mineral loss. The central nervous system is strongly affected from many directions, causing a state of stress that increases from normal to extreme or beyond the athlete's ability. In a quiescent state, an average of 5 ml of oxygen is used out of the total 20 ml of oxygen contained in 100 ml of blood as it passes through the capillary system of the tissues. The remainder is bound to hemoglobin.

Maximize effort to meet capacity: An individual's core competencies are often understood as the abilities that enable an individual to work effectively in a certain field of activity. Core competencies can be life skills, professional skills, expertise and courage. Demonstrated competencies include: (1) Performance results that bring high achievements; (2) The ability to perform that activity makes it very difficult for competitors to imitate; (3) The ability to apply that ability to expand implementation into many other types of activities.

In individual combat sports, it is the ability to control attitudes and behavior under stress when faced with adverse situations. In matches that require the ability to master situations and actions (against opponents of equal strength or with an advantage), especially in the final rounds when fatigue sets in and spreads, the level of tension reaching its limit is often the deciding point for the fate of the match. Therefore, in order to control and master the situation until the last minute of the match, sport athletes must always

#### 4.2.2. Types of stress and levels of stress

Types of stress: Based on the response capacity of the psychological process, it can be classified as follows: (1) Stress in the state of emotional control; (2) Stress in the perception of sports activities; (3) Stress in the formation and performance of sports movements; (4) Stress in mobilizing energy to adapt to the amount of movement; (5) Stress in the state of injury; (6) Stress in the state of sports illness... The stress levels are as follows:

(1) First level (temporary adaptation disorder): the subject accepts the stimulation of the situation and begins to analyze and evaluate the levels of harm and benefit of the problem. The activities of body functions are mobilized to release energy and capacity to respond to the impact situation.

At this level, extremely active rapid stress responses often occur. These reactions are associated with the process of excessive mobilization of the body's organ systems under sudden, new influences from external environmental factors or from some new form of activity. These reactions are sometimes so strong that they cause the body to fall into a state of temporary imbalance and maladaptation.

(2) Second level (increased general adaptive response): Mobilization of energy and capacity release from normal to maximum (stress from moderate to maximum level): At this level, the subject's state of stress manifests itself in altered levels of energy and capacity responses. An increase in stress to a certain point is beneficial in helping the subject release energy and capacity for action.

(3) Third level (sustainable adaptation): after the general adaptive response increases sharply, the body's functional responses gradually decrease, meaning that the body's response to stimulations does not have strong mutations as before. From the results of Merrson's research, it has been shown that the adaptive techniques of the body's functional systems are characterized by maximum economy and efficiency in their operation. Since the laws of adaptation are also manifested in the training process (physical adaptation and psychological adaptation), so the factors of exercise quantity gradually create a stable state of adaptation in sport athletes.

The results of many researchs on this issue show that, during the training process, Coaches need to find a regular relationship between the constant increase of stimulations during training and the tendency to increase the athlete's training speed in order to maximize the body's adaptability in the direction of development throughout the training and coaching process of athletes. There are 4 basic levels of adaptation of the active subject:

Level 1: Moderate stress, adapting to environmental conditions.

Level 2: High level stress positive adaptation.

Level 3: Excessive stress and adaptation.

Level 4: Excessive and maladaptive stress.

In sports activities, the manifestations of changes in endothelial and functional components are systemic and synergistic. Common sports diseases as well as sports injuries and psychological reactions are the most obvious manifestations of stress levels. Regular exercise with appropriate intensity, frequency and duration will effectively strengthen, maintain health and prevent disease. On the contrary, strenuous physical exercise combined with prolonged poor mental health can cause pathological changes and even death.

# 4.3. Conducting calibration of ATSMS questionnaire to suit shooting students on MBT03 shooting machine

The research has synthesized from many different documents on methods to determine the post-training psychology of athletes, the research has approached a number of works that are cited and used quite a lot today such as the ATSMS questionnaire to assess the post-training psychological state of students of the Dong Nai Province Shooting Team. The research has identified the following specific implementation steps:

Step 1: Determining the psychological state assessment scale after training for Shooting students, proceed to localize the assessment scale.

Step 2: Consulting with experts to adjust the original Chinese version of the scale to suit Vietnamese language and cultural characteristics, especially for Shooting students.

# 4.4. Determining the psychological state assessment scale after training for shooting students, proceed to Vietnamize the assessment scale

From the original Chinese version of ATSMS, two translators will translate it into Vietnamese, both of whom are excellent Vietnamese students studying in China (HSK level 6 - level 8). The two translators work independently, creating the first two draft translations of the Vietnamese version of ATSMS. When translating, focus on concepts rather than literal translation to maintain common language. After the two translators finished, we held the first meeting, compared the two translations and came up with the most correct version, only when there is consensus among the research team will the topics be properly included in the minutes. For topics with linguistic or cultural issues, only the translator is allowed to propose a final reasonable choice for all, the research team decides to use the most acceptable choice.

The consensus on the quality of the version was assessed by experts. They were all Vietnamese, for each item of each question, selecting appropriate assessments with clear levels of "agree" and "disagree", assessing the concept and other issues, basically agreed on the use of language. The result of this process was the first version of the Vietnamese version of ATSMS (T1.1).

After translating the ATSMS into Vietnamese, it

will be translated back into Chinese by two other bilingual translators. These two translators are also professional translators and independently complete the questionnaire.

After the translation is completed, a consensus is reached and a reverse version of the ATSMS is completed. The consensus on the Chinese reverse translation is re-evaluated by experts, finally the Vietnamese version of the ATSMS is completed. Through strict original inspection with all reviews including Chinese back translation, experts evaluate the Vietnamese version of ATSMS as follows: The Vietnamese version of ATSMS in semantics, idioms, experience, as well as other aspects of the concept, using simple words, most of which achieve the original meaning, the difficulty of translation grammar is moderate and it has been solved; slang or idioms have been met and converted relatively fully, the original phrases are expressed equivalently, the translation table uses some concepts, expressions different from the original word instead of nonexistent or inappropriate to Vietnamese culture, these conversions are acceptable, but should still be through local investigation to check and adjust, improve the influencing factors. Experts agree that the content and meaning of the Vietnamese version of ATSMS is equivalent to the original, the translation is easy to understand. Completing the translation process and test efficiency.

The Vietnamization process is specifically shown in the following diagram:





## 4.5. Conducting interviews with experts in the sports field to localize questions to suit Vietnamese language and cultural characteristics.

After the two translators agreed on the draft of ATSMS (The development of the Athletic Training State Monitor Scale), the research conducted interviews with 11 experts in the field of sports to evaluate and adjust the Vietnamese translation of the questions in the scale. Experts from Ho Chi Minh City University of Physical Education and Sports, Shooting Department - Dong Nai, University of Physical Education and Sports. Including 4 experts with doctoral degrees, accounting for 40%; 3 lecturers with master's degrees, accounting for 30% and 3 psychology bachelors, accounting for 30%.

#### 5. Discussion

In order to have a basis for proposing and selecting solutions to help improve the psychological state after training for students of the Shooting team. Choosing exercises is of particular importance, determining the training effectiveness for students. The choice of solutions depends on the characteristics of the sport, the goals and the psychological state of the students after training. The manifestations of the psychological state of students after training are often very different depending on each time, the choice of solutions cannot arbitrarily ignore the following basic steps: (1) Easy to measure; (2) Can be compared and evaluated by individual; (3) Can be compared and evaluated by region and country.

Based on the principles of physical education, sports training and from the above theoretical basis, the research gives 4 criteria for selecting exercises, as follows: (1) Solutions must be published in reputable domestic and foreign documents and must be highly reliable; (2) There must be means of testing and measuring; (3) There must be a scale or results from other groups of subjects for comparison.

Through the synthesis of documents from many authors, we have compiled exercises to help overcome post-training states for students of the Shooting team of students at Ho Chi Minh City University of Technical Education, focusing on some methods to resolve negative moods for students, as follows:

*First,* the method of regulating activity (regulation through muscle activity, regulation of brain excitement).

*Second,* onomatopoeic regulation method (through sensory organs to regulate psychology such as watching videos of weak teams winning against strong teams, forming courage...).

*Third,* relaxation regulation method (relieving fatigue, stress, shifting attention to sleep well, quietly...).

*Fourth,* the adaptive adjustment method (through the meridian system to regulate blood and nerves to achieve excitement, stable emotions and reason).

*Fifth*, methods to encourage confidence (perception of the meaning of competition, motivation, state of confidence before competition).

Sixth, situational analysis method (recognizing

form, competition tasks, overcoming psychological stress).

*Seventh,* educational methods... (traditional education of senior athletes, correcting bad mental states).

*Eighth,* regulateing between relaxation and relaxation (regulating relaxation and muscle relaxation is one of the good measures to regulate the psychological state).

*Ninth*, emotional coaching method (using the prestige and ability of the Coach to influence the thinking and emotional potential of sports students).

*Tenth,* music regulation method (using the appeal of music to increase the effectiveness of psychological regulation).

*Eleventh,* breathing regulation methods (shifting attention, reducing brain excitement, reducing sympathetic nervous processes...).

*Twelfth,* the method of regulating suggestion (repeating certain words many times to regulate the mind).

*Thirteenth*, the method of regulating imagination (based on the needs of the competition, recall previous successful movement situations in the competition).

#### 6. Conclusion

After the training sessions are relaxation exercises. This is a period of maximum reduction in the amount and volume of exercise. After heavy exercise, there is the participation of strong emotions and muscle tension... Therefore, the relaxation exercise will facilitate the students to have the appropriate time to bring the body back to a state of balance. The coach should use this time to talk personally with each individual in a friendly way, perhaps encouraging, providing information or giving feedback. If there are any disagreements between students during the training, they must try to resolve them after each session. This method has 3 parts: Relaxation training; posture training; breathing training.

Relaxation can be practiced in a comfortable sitting position on a chair or lying down. The practitioner must concentrate highly on the exercise, breathing evenly and rhythmically. All muscles are completely relaxed and soft. Eyes closed, not thinking about anything else. This is a method that coaches often combine with other ways to influence the emotions of athletes, such as: method of influencing by circumstances; method of regulating by language; method of influencing behavior and expressing emotions; method of massage; method of suggestion and positive imagination.

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### ỨNG DỤNG BẢNG HỎI ATSMS ĐÁNH GIÁ TRẠNG THÁI TÂM LÝ SAU TẬP LUYỆN CỦA SINH VIÊN Ở BẬC ĐẠI HỌC

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Trong thể thao hiện đại, bên cạnh chiến thuật, kỹ thuật, thể lực thì yếu tố tâm lý có vai trò quan trọng tới kết quả tập luyện và thi đấu. Trạng thái tâm lý tập luyện mà thành phần chủ yếu của nó là động cơ và cảm xúc rất đa dạng về sắc thái và cường độ. Nó có thể giúp cho người tập phần chấn, tự tin, cảm giác sung mãn, nhanh nhạy. Ngược lại, nó cũng có thể làm cho người tập thấy thiếu tự tin, căng thẳng, lo lắng hoặc chán nản; các phản ứng trở nên trì trệ, chậm chạp; phối hợp hoạt động trở nên rối loạn. Với ảnh hưởng của các trạng thái tâm lý đối với hiệu quả tập luyện của người tập lớn như vậy nên nó đã trở thành vấn đề mà tâm lý học thể thao rất quan tâm nghiên cứu. Ứng dụng bảng hỏi ATSMS đánh giá trạng thái tâm lý sau tập luyện của sinh viên bắn súng trên máy bắn tập MBT03 tại Trường Đại học Sư phạm Kỹ thuật Thành phố Hồ Chí Minh nhằm bổ sung thêm luận cứ chứng minh yếu tố tâm lý có vai trò quan trọng tới kết quả tập luyện và thi đấu.

**Từ khóa:** Bảng hỏi ATSMS; Tâm lý; Sau tập luyện; Trường Đại học Sư phạm Kỹ thuật Thành phố Hồ Chí Minh.