

A Study on the Application of Core Strength in Civil Aviation Flight Physical Education

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Abstract — In China, the core strength training is at present widely used in the fitness industry and competitive sports, while its application and research in physical education in common colleges and universities are still very rare. The literature-data and expert-interview method were used in this paper to analyze the civil aviation flight sports curriculum goal task, the civil aviation pilot's occupational physical demand, and the characteristics of the core strength training. It discusses the necessity and feasibility of the introduction of the core strength training in civil aviation flight physical education, and preliminary designs a number of content and methods of training and puts forward the corresponding countermeasures and suggestions, aiming at meeting the demand of civil aviation pilot's physique development and professional fitness, and providing reference for promoting civil aviation sports curriculum reform.

Keywords - civil aviation; aviation physical education; method design; core strength; application

I. INTRODUCTION

Originated in medical rehabilitation field, core strength training is a hotspot of research and application at home and abroad, and gradually, it is applied in the field of public fitness programs and competitive sports. Frederickson considered that Core strength is attached to the body core muscles and ligaments under the domination of the nervous system, Strength due to shrinkage, the purpose is the core in order to maintain the body parts and control movement, transfer onset of power, and at the same time actively in its movement, Is an important power source of human movement. Core strength training can stabilize the spine and pelvis, improve control and balance, increase energy output, enhance the efficiency of body coordination work, reduce energy consumption and prevent sport injuries. It is obvious that core strength training, which is quite different from traditional strength training whose purpose is to improve muscle strength in some parts of the body, has many effects, such as promoting the whole body muscle to work in harmony, improving work efficiency and reducing the sports injuries [1-6].

In recent years, along with college students' physical quality decline in overall in China, the civil aviation pilot college students face the same problem. The requirement for the content and tasks of physical training for pilot college students is aggravating. Higher power quality, physical stability, balance and coordination are the basic physical fitness for airline pilot profession [7-11]. In 2000, Wilson a sport medicine expert, thought that human body such as the core of waist, pelvic and hip muscles, its

stability can prevent bent spine injury, improve the balance ability of the spine. Domestic experts point out that, Core stability refers to the human body in motion through the core area of stability for limb muscle power to establish a fulcrum, in order to establish the conditions for onset of power transmission, In the center of the body moving stability and improve the strength of body posture [12-18]. The characteristics and functions of core strength training are better able to meet all these requirements, its application in civil aviation flight physical education is of great significance for enriching the content of courses and improving the civil aviation pilots related physical quality.

II. RESEARCH OBJECT AND METHODS

A. Research Objective

The core strength training in the application of the civil aviation flight physical education was regarded as the research object in this paper.

B. Research Methods

(1) Literature-data Method: Through Chinese HowNet, "core strength training" "the civil aviation flight sports" and other relevant keywords were used to retrieve relevant documentaries, and these documentaries were summarized and analyzed, thus, a foundation for the research of this paper was laid [19-22].

(2) Expert-interview Method: Some relevant experts and scholars in this field were interviewed to talk about civil aviation sports, flying professional fitness, core strength

training and some other questions. Interviewed sports teachers and pilot physical training coaches who had been working in front-line for many years were also interviewed to discuss the feasibility and necessity of the application of core strength training in civil aviation flight physical education, training content as well as methods and other issues.

III. THE RESULTS OF THE STUDY AND ANALYSIS

A. The Feasibility and Necessity of the Application of Core Strength Training in Civil Aviation Flight Physical Education

Core strength training can meet the demand of the civil aviation flight physical education course content

As for the civil aviation flight sports curriculum content, there are five top projects, that is, roller, hanging ladder, long-distance running, parallel bars and horizontal bar, basketball. The roller and hanging ladder, which are top two of the projects, belonging to civil aviation flight PE training equipment, are important content of civil aviation sports. Some research and civil aviation sports expert points out, through roller and hanging ladder training, civil aviation pilots can better improve their vestibular function, especially the stability of the vestibular, vestibular endurance ability and spatial orientation. However, in the learning and training practice of professional instrument, because of the overall decline in physical fitness of students, poor strength and poor coordination ability, some students can't be better to complete the training content and tasks, such as unstable body posture, hands off the bars, and as a result, causing certain sports injuries. For the students who will engaged in flight in the future, any physical damage and accidents are difficult to recover, even if their body recover, in the process of recovery, they may be left out of this profession. Core strength training can effectively compensate for the lack of traditional strength training. It not only can improve the students' strength, balance and coordination, but also improve the efficiency of muscles and prevent sports injuries. Therefore, it is feasible and necessary for its application in the civil aviation flight physical education.

The content of core strength training is innovative and diverse, easy to stimulate students' interest in civil aviation flight training

Physical fitness training itself is boring, and students need to have strong willpower and ability to endure hardship. In particular, students came into contact with the traditional strength exercises from primary or secondary schools, which made the freshness weak, so it is hard to arouse the enthusiasm of students for the training. Core strength training is the new trend of public health, such as flat panel support, and has aroused celebrity effect in the fitness industry. That Pan Shiyi and Lin Dan's battle in

WeChat circles spread widely makes pilot college students have a certain understanding of the emerging fitness training method, resulting in a certain cognitive basis in universities. In competitive sports training, the core strength training has become more mature, there are a variety of instruments, rich content, new forms of training and ideal training effect, etc. All these will help to promote interest and enthusiasm for the training.

Core strength training is conducive to meet pilot college students' need for professional physique

Among the core strength training, the introduction of Swiss ball, balance disc, suspension equipment and other unstable training equipment can make up for the shortcomings of traditional strength training, link between basic physical fitness training and aviation professional fitness training. Core strength training has become a necessary training sessions for civil aviation pilots from basic physical training to aviation professional equipment training. The civil aviation pilots need to have strength, balance stability and coordination capability.

Core stability strength training focuses on the training of deep small muscle groups, emphasizes the static contraction of two ends, and pays attention to the movement of 2 and 3 dimensions. Generally, the load is lighter, and in many cases the training is under unstable conditions, so that more small muscle groups, especially the accessory muscles around the joint participate in the movement, which can be training the athletes to stable relationship and control gravity center in sport. Therefore, three-dimensional training in core strength training has a certain effect to the body's balance and stability. Unstable environment of training is helpful for the improvement of the civil aviation pilots' deep muscle strength and stability ability. These functions and features are applicable to civil aviation pilot student's physical needs.

B. Content Design in Physical Education of Civil Aviation Flight Core Strength Training

Core strength training is the core area of the body of big muscles, small muscles and the deep muscles of the trunk balance, stability and strength training, Core strength is the basis of the speed, sensitivity and coordinated movement quality guarantee. Visible, core strength training not only has good effect on the stability of strength, balance, and body stability, but also The foundation of other physical quality and the human body, because the civil aviation pilots in students' physical education quality training frequency is low, it should be paid to stimulate student motivation, Cultivate the students' interest in training, keep things fresh, and arouse the enthusiasm of their class inside and outside practice.

In this paper, the Swiss ball was used as the main training equipment to preliminarily design the core strength training content for civil aviation pilot students. The Swiss ball has instability, and through the practice on

instability of the ball, can get fully stimulate deep core muscles and make the torso muscles involved in the effect of exercise and maintain the body balance and stability. In the civil aviation pilots in students' core strength training, according to the difficulty level gradually increased, as a local core muscle strength training should be started from the core stability training under steady state, and gradually

increase the difficulty on protection and finally implement the core of the local stability under transient muscle strength training. In the concrete practice shall strictly implement the guiding ideology of health first, and follow by Jane to numerous, from easy to difficult, etc. As shown in TABLE I.

C. Difficulty and Countermeasure of Core Strength Training in Civil Aviation Flight Physical Education

TABLE I. CIVIL AVIATION PILOTS IN PHYSICAL EDUCATION, THE CORE STRENGTH TRAINING CONTENT AND METHOD OF SAMPLE

<i>Environment and Trait</i>	<i>Training Method</i>	<i>Training Focuses</i>	<i>Action Graphical</i>
Steady Environment Empty-Handed Training	Plank	Head in line with body, 90-120s, 3 times	Common
	One arm or leg plank	Head in line with body, 60-90s, 3 times	
Unstable Environment Static Training Equipment	Prone plank(arm hold the ball)	Head in line with body 60-90s, 3 times	Figure 1. (a)
	Prone plank(feet hold the ball)	Head in line with body, 60-90s, 3 times	Figure 1. (b)
	Lie on the back, foot hold the ball	Head in line with body, 60-90s, 3 times	Figure 1. (c)
	Limb knees through ball	Keep balance, 60-90s, 3 times	Figure 1. (d)
Unstable Environment Dynamic Training Equipment	Hold the ball back, abdominal curl	Keep balance, Do the Sit-ups Exercise, A group of 20, 3 times	Figure 1. (e)
	Hold the ball back down and Back	Back on the ball, the Arm back down, Keep balance, a group of 10, 3 times	Figure 1. (f)

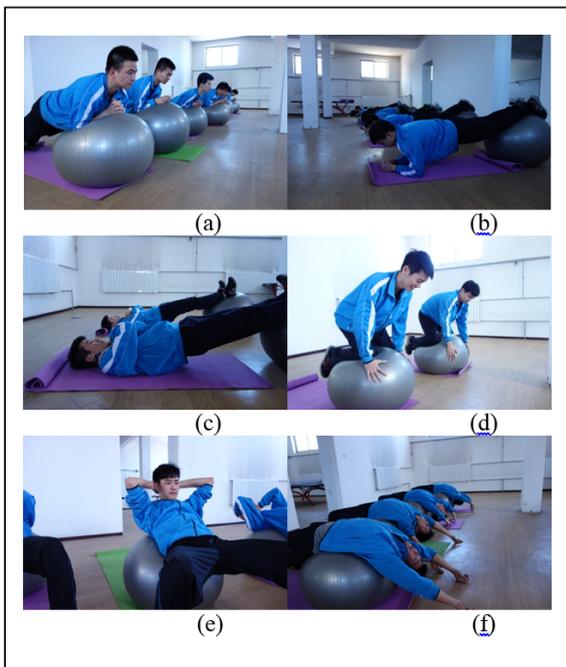


Figure 1. Action graphical of Training Method

The contents above have confirmed that the core strength training is feasible and necessary to applied in civil aviation physical education The core strength training is currently in the domestic health and has a good base for application in competitive sports training and scientific research base, but very rare in the domestic application of school physical education and research. Therefore, first of all, civil aviation flight sports coaches and teachers should learn more know two core training theory and method, and combined with their own experience in teaching and school curriculum resource to design the corresponding training methods. In the second place, the core strength training can't completely replace the traditional strength training, but used as the beneficial supplement, and how to make the combination of both good and perfect will still be necessary to constantly practice and exploration. In the end, the related departments of civil aviation colleges should strengthen the training of the teachers, and appropriately add some necessary equipment for the core strength training.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Core strength training as a currently emerging forms of physical training, rich contents, various forms and can enrich the civil aviation flight sports curriculum content, beneficial to enhance the civil aviation pilots, students' physical quality level, And can meet the demand of civil aviation pilots future career, This article mainly to the Swiss ball as the core strength training equipment, The preliminary design of some core strength training for civil aviation pilots, And introduces some training methods and requirements, The next step should be to experiment in civil aviation pilots in the practice of physical education, To fly in the civil aviation college physical education to promote the application and development.

B. Suggestion

Core strength training in civil aviation flight in the practice of physical education should be based on specific situation and application of flexible design, through practice constantly improve, and pay attention to the interest guidance, establish long-run effective mechanism, As the civil aviation pilots lifelong physical training content.

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