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Effect of Yoga Practice on Functional Movement Screening Test Results of Female College Students in Changde City

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Abstract: As an ancient practice method, yoga training is composed of asana practice, meditation, breathing and sitting meditation. It can be summarized into two parts: meditation, breathing and self-awareness based on mindfulness practice and asana movement based on physical quality practice. Therefore, yoga is deeply loved by female college students, but yoga teaching injury also occurs from time to time. Functional motor screening is an action mode evaluation system. Through screening tests on the human body, it can intuitively present the problems existing in the flexibility and stability of the human body, and evaluate the movement disorders and weak chain of the human body. It plays a certain role in improving sports performance and reducing the risk of sports injury. Therefore, this paper will use FMS to evaluate and test the yoga practice of female college students in Changde City. The experiment adopts sampling survey method, experimental analysis method and mathematical statistics method to study. In the experiment, 100 female college students were selected as the data set and divided into experimental group and control group. The results showed that after 12 weeks of FMS test, the body of female college students had the following changes: BMI decreased by -1.43±0.09, and *P<0.05, indicating that the difference was significant; WHR, the waist-to-hip ratio of female college students, decreased by -0.06±0.08, and **P<0.01; PBF body fat percentage also decreased by -1.62±2.50, and *P<0.05,; The sit-and-reach forward flexion was increased by 2.89±0.05, and **P<0.01,; However, FVC increased by 270.4±19.4, and **P<0.01; The FMS test score increased from 11.62±1.93 to 14.13±1.57, and P=0.00<0.01 was found after T calculation of the experimental data. All these show that yoga training can optimize the proportion of body composition and beautification of body shape after correction training, especially the most obvious impact on waist-hip ratio, and has a good function of reducing fat and molding.

1. Introduction

Yoga is one of the fitness programs favored by female college students. Yoga training can regulate emotions and reduce the tension caused by excessive pressure. As a result, more and more college students begin to practice yoga. Yoga poses vary widely, involving the flexion and extension of joints and muscles on different planes, as well as the balance, squeeze and twist of the body. Therefore, there will often be students in the inappropriate practice of movement, sports injury. Therefore, finding scientific methods to effectively prevent and reduce yoga injuries is the top priority at present.

At present, in order to avoid sports injury, and the specialization and standardization of yoga practice, so through the introduction of functional screening (FMS) to understand the physical condition of college students, improve the skill level of college students, to avoid sports injury related research has been carried out at home and abroad. Bekhradi A, a scholar, made statistics on the number and types of yoga injuries in recent years, and found that the incidence of injuries in yoga practitioners was 1.18 times per 1000 yoga hours, and lower limb injuries accounted for 64% of the total injuries. Especially the hips, hamstrings, knees, ankles, feet, and toes. Injuries to the upper limbs accounted for 13%, while injuries to the head and trunk accounted for 23% [1]. Scholar Kraus E explored the possible interdependence between sports injury and FMS, and found that the potential cognitive strategy shift from internal (FMS) to external (LESS) and different muscle recruitment patterns were potential explanations for the insignificant linear relationship between FMS and LESS data [2]. Scholar Kryger K included seven interrelated movement activities through the FMS test to analyze the quality of basic movement patterns. The aim of his study was to determine the effect of FMS test results on the frequency of sports injuries in football players, and the results showed that FMS provides good conditions for estimating injury risk [3]. The research of these scholars let us understand that FMS has a positive effect on scientific physical training, which can improve the physical function ability of athletes, improve the competitive level of athletes and reduce sports injuries in training competitions. But they did not go deep into how to prevent sports injuries.

Therefore, this paper discusses the prevention of yoga training injury and improvement of yoga skill level by FMS through literature research, sampling investigation, mathematical statistics and experimental analysis. The research object of this paper is 100 female college students sampled in Changde city. The research purpose is to understand the yoga practice of students, analyze the correlation between functional test performance and gender, age, BMI and other factors, and provide test experience for students, and provide reference basis for subsequent scientific yoga training and prevention of yoga sports injury [4-5].

2. Definition of Relevant Concepts

2.1 Concept of Yoga

In a broad sense, yoga is philosophy; in a narrow sense, yoga not only plays a role in the spiritual world of people, but also plays a role in the body of people, and the two are not in conflict, but in the same way, in harmony with each other. Yoga is a combination of static and dynamic physical activity, with soothing music meditation, breathing movements combined with the practice of yoga poses. Through the practice of yoga can adjust the body and mind, clear the distracting thoughts. Yoga asanas make the body's movements and postures form various twists and stretches, thus promoting the coordination of the body and the balanced development of the limbs [6-7].

2.2 Concept of Functional Motion Screening (FMS)

Functional movement screening (FMS) cannot be directly related to the motor performance of the test subjects, and the motor performance of all the test subjects has little correlation with functional movement screening (FMS) [8-9]. In order to enable different types of individuals to get the same effective help, so as to improve the comprehensive evaluation of human function, many new techniques have been proposed. The simple and effective test method, the utility model can be used to evaluate the performance of different types of sports, and can help us understand how the human muscle system works. It consists of seven basic exercise modes (squat, lunging squat, hurdle step, shoulder flexibility, active straight knee lift, trunk stability push-up, rotational stability, and three exclusion tests (shoulder movement elimination test, push-up elimination test, and lower back pain elimination test). These functional tests are a comprehensive way of assessing an individual's level of ability by measuring the amount of stress placed on the body. By analyzing the characteristic quantities and corresponding values of each item, we can calculate what exercises are most suitable for people to do under various exercise intensities. A final result is obtained by summing up the indicators [10-11].

2.3 Sports Injuries

Injuries occur in sports, called sports injuries. Sports injury refers to the physiological and pathological phenomenon that causes a certain degree of damage to the body when athletes are engaged in a certain sports activity, also known as trauma or injury [12]. Common: fall injury, fracture injury, ligament rupture and so on; the main causes of trauma are contusion and abrasion and bleeding.

2.4 Yoga Injury and Prevention

The types of injuries caused by yoga practice are mainly divided into six types: leg muscle strain and so on, head nerve injury, cervical and lumbar spine injury, waist muscle strain, knee sprain, ankle sprain and so on [13-14]. In daily exercise, people who often practice yoga often neglect the protection of spine and knee joint, resulting in injuries to these parts. Therefore, in the practice of yoga need to pay attention to scientific training, systematic training, mainly to correct their yoga movements, and in the practice of the cervical spine need to focus on protection, waist and knee [15].

3. Experimental Analysis and Results

3.1 Experimental Design

Firstly, 100 female college students were divided into two groups: group A and Group B. Among them, group A is the experimental group and group B is the control group. The experimental period was 12 weeks. Then it is divided into three stages: the first stage is the basic training mainly to improve the stretch of muscles and joint flexibility. The second stage is to improve the training: training students' control and balance ability; the third stage is the reinforcement stage to repeat the learned action reinforcement. Group A is the yoga practice after the correction training, group B is the yoga practice without the correction training. The basic information of the experimental subjects is shown in Table 1 below:

Table 1: Basic information of experimental subjects

NUM	Gender	Age	Height	Weight
Experimental Group A	Female	20.3±0.55	160±0.07	56.23±3.85
Control group B	Female	20.3±0.55	161±0.06	57.21±2.89

3.2 Comparison of Students' Total Score of FMS before and After the Experiment

The following is the FMS test scores after 12 weeks and three stages of yoga practice. The statistical software is SPSS20.0 statistical software. The specific experimental results are shown in Table 2:

Table 2: Changes in the total FMS scores of the experimental and control class before-after experiment

Group	FMS Total Points $\bar{X} \pm S$	
	Before the Experiment	After the Experiment
Experimental Group A(n=50)	11.62±1.93	14.13±1.57 **
Control group B(n=50)	11.91±1.53	12.13±1.68

(Note: ** indicates P<0.01, indicating a significant difference between the scores before and after the experiment, while *P<0.05 indicates a significant difference and #P>0.05 indicates no significant difference)

It can be seen from Table 2 that: Before the experiment, the FMS test score of female college students in the experiment group A was 11.62±1.93, and that of female college students in the control group B was 11.91±1.53. After the variance analysis of SPSS20.0 statistical software, P=0.52>0.05 was obtained, which indicated that before the experiment, There was little difference in physical fitness between the experimental group and the control group.

Table 3: Changes in the total number of FMS scores in the experimental &control class before-after experiment

test content	Experimental Group A(n=50)				Control group B(n=50)			
	Before the Experiment		After the Experiment		Before the Experiment		After the Experiment	
FMS≥14points	16	32%	42	84%	18	36%	18	36%
FMS<14points	34	68%	8	16%	32	64%	32	64%

According to the FMS scores of 100 female college students in the experimental group and the control group in Table 3, there are only 34 students with FMSFMS⩾14 scores before the experimental test, which indicates that these students are relatively weak before the test, so it is likely to find sports injuries during yoga practice. After 12 weeks of training, the students' FMS score increased from 11.62±1.93 points to 14.13±1.57 points. After T calculation of the experimental data, it was found that P=0.00<0.01, indicating that after the correction training, the yoga practice of female college students has been significantly improved.

3.3 Change Results of Various Physical Indicators

Table 4: Changes in Body Composition before and after the Experiment

Test Index	Before the Experiment	Before the Experiment	variation	P
BMI kg/cm2	21.34±2.42	19.91±2.51	-1.43±0.09	0.03*
WHR/%	0.78±0.09	0.72±0.09	-0.06±0.08	0.00**

PBF/%	28.93±6.72	27.31±6.21	-1.62±2.50	0.02*
sit-and-reach	12.12±5.13	15.21±5.18	2.89±0.05	0.00**
FVC/ml	2680.9±601.7	2951.3±621.1	270.4±19.4	0.00**

(Note: ** indicates P<0.01, indicating a significant difference between the scores before and after the experiment, while *P<0.05 indicates a significant difference and #P>0.05 indicates no significant difference)

It can be seen from Table 4 that after 12 weeks of yoga training, the body of female college students has the following changes: BMI decreased by -1.43±0.09, and *P<0.05, indicating that the difference is significant; WHR, that is, the waist-hip ratio of female college students, decreased by -0.06±0.08, and **P<0.01, indicating that there was a very significant difference before and after the experiment, that is to say, yoga practice has a good effect on shaping the body shape; PBF body fat percentage also decreased by -1.62±2.50, and *P<0.05, indicating a significant difference; The sit-and-reach forward flexion was increased by 2.89±0.05, and **P<0.01, indicating that there was a very significant difference in flexibility before and after the experiment, and also indicating that yoga practice can help improve flexibility; However, FVC increased by 270.4±19.4, and **P<0.01. There was a very significant difference before and after the experiment, which indicated that the abdominal breathing and chest breathing method used in yoga practice could improve the cardiopulmonary endurance of the practitioners by exercising respiratory muscles, improving the utilization rate of oxygen and changing the cardiac output.

3.4 Comparison of Comprehensive FMS Test Results

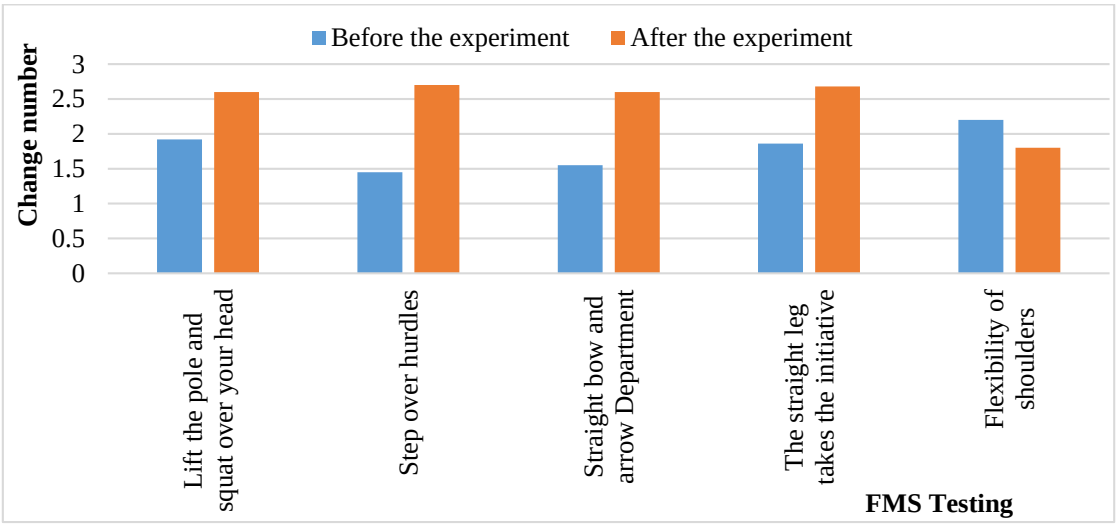

Figure 1: Change of FMS test value

Figure 1 shows the change diagram of specific FMS test items. It can be seen from the figure that the scores of the subjects in the FMS test before and after the experiment showed an increasing trend and were statistically significant. The results showed that free-hand exercise on Pilates pads could improve the stability and flexibility of knee, hip and ankle joints in female college students. At the same time, it plays a significant role in improving the dynamic stability and body balance ability of female college students.

3.5 Analysis of Experimental Results

It can be seen from Table 4 that yoga practice can optimize the proportion of body composition and beautified body form, especially the influence of waist-hip ratio is the most significant, and the

utility model has a good effect of reducing fat and molding. It can be seen from the above that yoga exercise has a positive effect on improving women's body shape. Continuous yoga training can improve the function of the cardiovascular system of female college students, and has an ideal promotion effect on strengthening muscles and endurance. At the same time, long-term adherence to yoga exercise can also effectively improve women's mental health level, contribute to their physical and mental health development. Through the comparative experiments in Table 2 and Table 3, it can be known that the risk of physical injury caused by yoga exercise can be reduced after corrective training. Therefore, female college students in yoga exercise, must choose the right time and place to implement, and adhere to the long-term practice. The corrective training program can appropriately improve the score of girls' functional movement screening, and score before the test, the more the increase, the more significant the effect, the difference is very significant.

4. Conclusion

Yoga practice can improve female college students' joint mobility, coordination of movement standards, strong trunk muscle stretch ability, core stability enhancement, and strength enhancement. In the process of movement to make people produce a pleasant feeling, so as to achieve the effect of physical and mental integration. Yoga practice can also reduce the body shape and weight of female college students, and effectively improve the body composition. Yoga practice has a significant effect on the physical quality of female college students, but there are differences among different sports. In yoga practice, FMS can be used to diagnose students' body flexibility and stability, and find out the defects in technical movements. At the same time, through the corrective training for the practitioner, the wrong movement can be reduced or even disappeared, so as to achieve the purpose of preventing sports injury. Targeted correction exercises are helpful to improve the basic movement ability and technical level. At the same time, it is also a simple and practical method to predict the injury in advance. In the corrective exercise, pay attention to avoid wrong movements, but also pay attention to correct posture and relaxation methods. Corrective training can improve female college students' yoga movement pattern, or enhance basic flexibility and stability. The corrected movement is closer to the standard posture and movement state, which can better promote healthy development and enable the practitioner to be more proactive in the learning process. Corrective training is complementary to FMS and is based on the results of FMS rather than physical exercises.

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