ABDOMINAL CORE TRAINING IN WINDSURFING

TREINAMENTO DO CENTRO ABDOMINAL NO WINDSURF

ENTRENAMIENTO DEL NÚCLEO ABDOMINAL EN WINDSURF

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ABSTRACT

Introduction: In Chinese windsurfing, it can be seen that although some coaches adopt relevant contents of abdominal core stability in their physical fitness training, such implementation does not perform its maximum potential on youngsters, mainly due to the lack of a specific protocol. Objective: Study the application of abdominal core stability training in windsurfing athletes. Methods: 14 young athletes in a windsurfing team were selected as volunteers and randomly divided into experimental control groups. A specially designed training protocol for abdominal center strengthening was added to conventional training for the experimental group. Fitness tests were performed, in both groups, before and after the intervention. The collected data were statistically analyzed and discussed. Results: The experimental group's 15m butterfly swim performance was improved by 0.25s, being 0.21s faster than the control group (P<0.05). Conclusion: The strengthening training protocol for the abdominal core stability presented in this study may improve the ability of windsurfing athletes, helping in dynamic and static balance. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: *Water Sports; Abdominal Core; Physical Fitness.*

RESUMO

Introdução: No windsurf chinês, pode-se constatar que, embora alguns treinadores adotem conteúdos relevantes de estabilidade do centro abdominal em seus treinamentos de aptidão física, tal implementação não desempenha o seu máximo potencial sobre os jovens principalmente pela falta de um protocolo específico. Objetivo: Estudar a aplicação do treinamento de estabilidade do centro abdominal em esportistas de windsurf. Métodos: 14 jovens atletas em equipe de windsurf foram selecionados como voluntários, divididos aleatoriamente em grupos experimental controle. Um protocolo de treinamento especialmente desenvolvido para o fortalecimento do centro abdominal foi adicionado ao treinamento convencional ao grupo experimental. Os testes de aptidão física foram realizados, em ambos os grupos, antes e após a intervenção. Os dados coletados foram estatisticamente analisados e discutidos. Resultados: O desempenho do nado borboleta de 15m do grupo experimental foi aprimorado em 0,25s, sendo 0,21s mais rápido do que o do grupo controle (P<0,05). Conclusão: O protocolo de treino de fortalecimento para estabilidade do centro abdominal apresentado neste estudo pode melhorar a capacidade dos esportistas de windsurf, auxiliando no equilíbrio dinâmico e estático. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Esportes Aquáticos; Centro Abdominal; Aptidão Física.*

RESUMEN

Introducción: En el windsurf chino, se observa que, aunque algunos entrenadores adoptan contenidos relevantes de la estabilidad del centro abdominal en su entrenamiento físico, dicha implementación no rinde su máximo potencial en los jóvenes debido principalmente a la falta de un protocolo específico. Objetivo: Estudiar la aplicación del entrenamiento de la estabilidad del centro abdominal en deportistas de windsurf. Métodos: Se seleccionaron 14 jóvenes atletas de un equipo de windsurf como voluntarios, divididos aleatoriamente en grupos de control experimental. Al grupo experimental se le añadió un protocolo de entrenamiento especialmente diseñado para el fortalecimiento del centro abdominal, además del entrenamiento convencional. Se realizaron pruebas de aptitud física, en ambos grupos, antes y después de la intervención. Los datos recogidos se analizaron y discutieron estadísticamente. Resultados: El rendimiento del nado de 15 metros mariposa del grupo experimental mejoró en 0,25s, siendo 0,21s más rápido que el grupo de control (P<0,05). Conclusión: El protocolo de entrenamiento de fortalecimiento de la estabilidad del centro abdominal presentado en este estudio puede mejorar la capacidad de los deportistas de windsurf, ayudando al equilibrio dinámico y estático. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Deportes Acuáticos; Núcleo Abdominal; Aptitud Física.*

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INTRODUCTION

In recent years, with the continuous development of kinematic chain theory and neuromuscular system theory, core stability training has gradually been applied and promoted in the field of competitive sports training, it has gradually become an important part of the physical training of competitive sports athletes, which is also true in the physical training of young windsurfers.[1] However, looking at the current development of physical fitness training for Chinese young windsurfers, it can be found that although some coaches are organizing physical fitness training, incorporating the relevant content of core stability training, but because of not really understanding the value, essence and implementation points of core stability training, therefore, it has not played its due role in the improvement of the physical fitness of young windsurfers and the improvement of special sports performance.[2]

METHOD

Research object

A total of 14 young athletes from swimming team A were selected as test subjects, before the training and intervention, they were randomly divided into an experimental group and a control group, with 7 members in each group, before the implementation of the training intervention, the exercise ability was tested respectively, the test data showed that there was no significant difference between the two groups (P>0.05), at the same time, the 14 athletes had no sports injuries before the experiment.[3,4]

Experimental method

The experimental group and the control group were given 8-week intervention training.

Subjects were required to do 5 minutes of preparatory activities before the test, and then prepare for the test according to the corresponding test requirements. During the test, 6 kinds of standing postures are required to be tested.[5] The general requirements are: When standing on one foot, the other foot is naturally lifted 20~30cm away from the test table, and the hands are naturally drooping on the side of the body. Each test time is 30s: Standing balance on one foot with eyes open; Standing on one foot on one foot with eyes open; Standing on one foot on one foot with eyes closed; Standing on one foot on one foot with eyes closed; Stand with your eyes open and balance on your feet; Stand with your eyes closed and balance on your feet. The test uses the G0ODBALANCE balance test system produced by METTTUR, Finland.[6,7]

Data Mathematical Methods

SPSS22 software was used for data statistics and processing, and the data results were presented in the form of "mean ± standard deviation". The difference test of the test indicators between the control group and the experimental group before the experimental intervention, and the difference of the test indicators after the experimental intervention, all were performed using independent samples t-test. The level of statistical significance was defined as P<0.05.[8]

Ethical Compliance

Research experiments conducted in this article with animals or humans were approved by the Ethical Committee and responsible authorities of Hefei College of Finance & Economics following all guidelines, regulations, legal, and ethical standards as required for humans or animals.

RESULTS AND ANALYSIS

The results of the balance ability test between the experimental group and the control group

Tables 1 and 2 record before and after the experimental intervention, changes in the static balance ability of the test subjects, after 8 weeks of core stability training, the static balance ability test indicators of the experimental group: The speed and distance of the eyes closed and opened with one foot, and eyes closed with both feet in the X-axis (front and rear) and Y-axis (left and right) directions have been significantly improved, the test results before and after the test P<0.05, on the contrary, the length of the COP (pressure center) trajectory curve, there was no significant difference between the subjects before and after, P=0.276.

Change results of swimming special ability indicators between the experimental group and the control group

As an important special indicator, the 15m stroke edge underwater butterfly leg performance is widely used in training practice, it reflects the effect of an athlete's underwater kick, as well as the ability to maintain and control a streamlined body posture, reduce drag, and have good body control, after the experimental intervention of core stability, the performance of the experimental group's 15m edging underwater butterfly leg improved by 0.25s, compared with the control group that only performed conventional training, it was 0.20s faster, and the test results were tested P<0.05, it shows that there is a significant difference between the experimental group and the control group before and after the 15m edge stroke underwater butterfly leg performance, there are also indicators with similar changes in the 100m main item score, the specific data are shown in Table 3 and Figure 1.[9]

Table 1. Comparison of balance ability test results between the experimental group and the control group before experimental intervention.

Test indicators	test group	control group	T	P
Movement speed in X-axis direction with eyes closed with one foot (mm/s)	4.02±0.87	4.61±1.14	-2.015	0.063
Y-axis movement speed with eyes open with both feet (mm/s)	6.07±1.92	6.20±1. 81	1.466	0.164
X-axis movement distance of both feet with eyes closed (mm)	120.42±26.43	137.6±34.47	-2.011	0.065
Y-axis movement distance with one foot open (mm)	181.90±58.20	186.08±54.27	-0.366	0.718
COP trajectory curve length (mm)	618.61±164.41	548.66±225.75	1.055	0.308

Table 2. The comparison of the results of the balance ability test between the experimental group and the control group after the experimental intervention.

Test indicators	test group	control group	T	P
Movement speed in X-axis direction with eyes closed with one foot (mm/s)	3.60±0. 46	4.15±0.45	2.604	0.022
Y-axis movement speed with eyes open with both feet (mm/s)	5.33±0.80	5.71±1.33	0.793	0.042
X-axis movement distance of both feet with eyes closed (mm)	108.36±14.23	124.38±30.51	2.568	0.024
Y-axis movement distance with one foot open (mm)	159.94±25.24	174. 74±42. 21	0.796	0.043
COP trajectory curve length (mm)	471.24±246. 81	675.51±120.21	1.220	0.276

Table 3. Comparison of changes in special ability indicators between the experimental group and the control group before experimental intervention.

Test indicators	test group	control group	T	P
15 m kicking edge underwater butterfly leg result(s)	-0.25±0.04	-0.04±0.03	0.67	0.040
50 m Main Item Score(s)	-0.30±0.10	-0.06±0.04	0.297	0.771
100 m Main Item Score(s)	-0.81±0.04	-0.30±0.15	-2.171	0.034

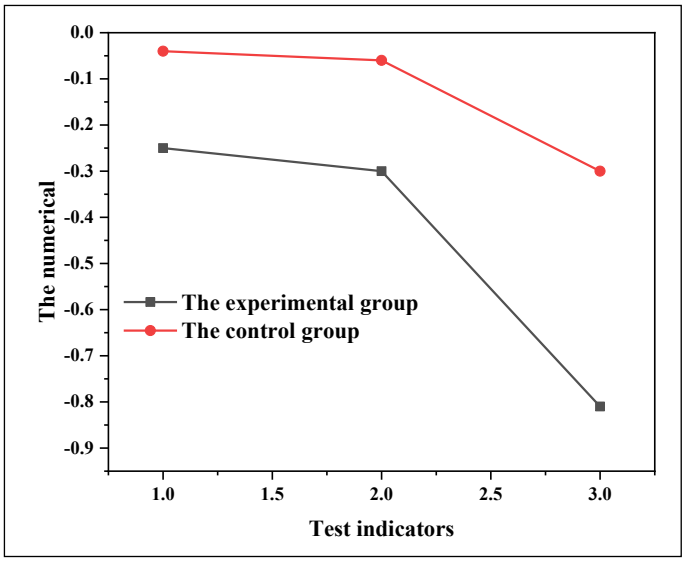

Figure 1. Changes of the special ability indicators between the experimental group and the control group before the experimental intervention.

Analysis of the evaluation index of the experimental effect

For competitive sports, balance ability is one of the basic guarantees for athletes to achieve competitive performance, especially in sports that emphasize maintaining body posture and movement coordination like swimming, good balance is the fundamental requirement for athletes to complete their skills. The balance ability of the human body is divided into static balance ability and dynamic balance ability, the author selects static balance ability as the evaluation index of the stability of swimmers, in the static balance test, the moving distance of the X-axis with the eyes closed with one foot, the moving speed of the X-axis with the eyes closed with one foot, the moving distance of the Y-axis with the eyes open with one foot, the moving speed of the Y-axis with the eyes open with both feet, and the length of the COP trajectory curve, the above balance ability test indicators can better reflect the athlete's ability to maintain movement stability and balance. The speed and distance of the body shaking back and forth, and the length of the shaking trajectory, the larger the value, the worse the balance ability of the human body.[10] Before and after the experimental intervention in the experimental group, the balance ability indicators such as the moving distance of the X-axis with the eyes closed with one foot, the moving speed of the X-axis direction with the eyes closed with one foot, the moving distance of the Y-axis with the eyes opened with one foot, and the moving speed of the Y-axis with the eyes opened with both feet were significantly improved before and after the experimental intervention. sexual differences, describe the core stability training program used on land and water, it can greatly improve the ability of the athletes in the experimental group to maintain movement stability and balance; In particular, the performance of the 15m edged underwater butterfly legs in the experimental group was significantly improved compared with the control group, indicating that the use of the core stability training program has a certain improvement in the ability of young swimmers to control their bodies underwater.

CONCLUSION

The research is based on the laboratory balance ability test and the partial evaluation index of swimming special ability under the condition of 25m short pool, taking 14 young swimmers as the test objects, 8 weeks of intervention training, in order to explore the application of the water and land core stability training mode in the youth swimming training. Research indicates: Except for the length of the COP (pressure center) trajectory curve, there was no significant difference between the experimental group and the control group before and after the test (P=0.277), other indicators have significant differences (P<0.05); The use of unstable training methods such as plank support, Swiss ball, balance ball-pimp pull, etc. has a positive effect on improving the single, repetitive, and boring characteristics of land physical training, it can more effectively stimulate the enthusiasm of athletes for physical training on land and strengthen the connection of technical movements in water. Maintain the instability of training methods and strengthen the flexibility and mutual coordination of small muscle groups, and reasonably arrange the ratio and timely transformation of core stability training on land and technical training on water, it has a positive effect on the performance improvement of young swimmers.

The author declares no potential conflict of interest related to this article.

AUTHORS' CONTRIBUTIONS: The author made significant contributions to this manuscript. Lijun Zhang: writing, data analysis, article review and intellectual concept of the article

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