INFLUENCE OF GYMNASTIC GAMES ON STANDING LONG JUMP

INFLUÊNCIA DOS JOGOS DE GINÁSTICA EM SALTOS EM DISTÂNCIA HORIZONTAL

INFLUENCIA DE LOS JUEGOS GIMNÁSTICOS EN EL SALTO DE LONGITUD HORIZONTAL

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ABSTRACT

Introduction: The standing long jump consists of four parts: pre-swing, take-off, flying, and landing. Objective: Analyze the influence of gymnastics game fitness on standing long jump. Methods: Eight kindergartens in a city were selected and divided into experimental and control groups. The children in the experimental group were intervened in gymnastics and game fitness modules. Each module was intervened in a rolling cycle in the morning and afternoon outdoor activities of children from June 1, 2021, to March 31, 2010, for nine months. Results: During the intervention period, there was no significant difference between the experimental group and the control group ($P > 0.05$), but there was a significant difference between the experimental group and the girls before and after the experimental intervention ($P < 0.05$), while the difference between boys was not statistically significant, indicating that the range of ankle movement of girls was slightly more affected than boys during the fitness intervention. Conclusion: With the increase in age and training time, the change range of joint angles of older children in the experimental group is significantly higher than that in the control group. ***Level of evidence II; Therapeutic studies - investigation of treatment results.***

Keywords: Gymnastics; Play; Sports.

RESUMO

Introdução: O salto em distância horizontal consiste em quatro partes: corrida de aproximação, impulsão, voo e queda. Objetivo: Estudar a influência da ginástica no salto em distância horizontal. Métodos: Oito jardins de infância em uma cidade foram selecionados e divididos em um grupo experimental e um grupo de controle. As crianças do grupo experimental atuaram nos módulos de ginástica e de condicionamento físico. Cada módulo foi submetido a um ciclo contínuo de atividades ao ar livre de manhã e à tarde de atividades infantis, de 1º de junho de 2021 a 31 de março de 2010, por um total de 9 meses. Resultados: Durante o período de intervenção, não houve diferença significativa entre o grupo experimental e o grupo controle ($P > 0,05$), mas houve diferença significativa entre o grupo experimental e as meninas antes e depois da intervenção experimental ($P < 0,05$), enquanto a diferença entre os meninos não foi estatisticamente significativa, indicando que a amplitude do movimento do tornozelo das meninas foi ligeiramente mais afetada do que a dos meninos durante a intervenção de condicionamento físico. Conclusão: Com o aumento da idade e do tempo de treinamento, a faixa de variação do ângulo de articulação das crianças mais velhas no grupo experimental foi significativamente maior do que a do grupo de controle. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Ginástica; Jogo; Esportes.*

RESUMEN

Introducción: El salto de longitud horizontal consta de cuatro partes: carrera de aproximación, impulsión, vuelo y caída. Objetivo: Analizar la influencia de la gimnasia en el salto de longitud de pie. Métodos: Se seleccionaron ocho guarderías de una ciudad y se dividieron en un grupo experimental y otro de control. Los niños del grupo experimental realizaron módulos de gimnasia y fitness. Cada módulo intervino en un ciclo continuo de actividades al aire libre por la mañana y por la tarde desde el 1 de junio de 2021 hasta el 31 de marzo de 2010, durante nueve meses. Resultados: Durante el período de intervención, no hubo diferencias significativas entre el grupo experimental y el grupo de control ($P > 0,05$), pero sí entre el grupo experimental y las chicas antes y después de la intervención experimental ($P < 0,05$), mientras que la diferencia entre los chicos no fue estadísticamente significativa, lo que indica que la amplitud de movimiento del tobillo de las chicas se vio ligeramente más afectada que la de los chicos durante la intervención de acondicionamiento físico. Conclusión: Al aumentar la edad y el tiempo de entrenamiento, el rango de variación de los ángulos articulares de los niños mayores del grupo experimental es significativamente mayor que el del grupo de control. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Gimnasia; Juego; Deportes.*

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INTRODUCTION

Based on the research of movement development and standing long jump, this study intends to explore the age characteristics of students' standing long jump movement development and the effect of external target guidance on students' standing long jump movement skills from the perspective of kinematics.Action is the basic ability for human beings to survive in the environment. Suharti, S. and others believe that people gradually learn to crawl, walk, write, throw a ball, run and all other forms of human action.[1] Tanas, A. R. and others think that action development studies the changes of human action behavior, the whole process of change and the factors affecting them in human life. Its research contents include: 1. The changes of human visible movement behavior itself, for example, the process of human from infant crawling and toddlering to walking, running and jumping proficiency to the gradual loss of motor ability in the elderly.[2] 2. The process of action behavior change and its reasons. For example, the process of action development will be affected by genetic factors, environmental factors, task factors, individual growth and development and other factors. These problems will not only affect the results of action development, but also make the process of action development very different. Kolimechkov, S. and others believe that according to the different muscle groups completing the action, the action can be divided into coarse action and fine action.[3] The development of gross movement plays an important role in students' early development and is the basis of students' fine movement development. The development of students' gross movements not only affects personal physical activities and health status, but also promotes the development of students' social ability.

METHOD

Through systematic theoretical research and in-depth practical investigation, this paper designs six gymnastics and game fitness modules based on physical quality according to the physical characteristics and sports ability of children in small, middle and large classes of kindergartens. (Table 1) The control group did not change the normal learning and sports activities of the kindergarten, and did not apply the sports fitness module set by the experimental group.[4]

The data are expressed by (x + s), the comparison between the two groups is tested by independent samples, the test between the experimental group and the control group is expressed by *, * represents $P < 0.05$, * * represents $P < 0.01$; The tests before experiment (test 1) and after experiment (test 2) are expressed by #, # represents $P < 0.05$, ## represents $P < 0.01$.[5]

RESULTS AND ANALYSIS

It can be seen from the research results in Table 2 that after a certain period of gymnastics game fitness program intervention, there is a significant statistical difference between the experimental group and the control group.[6] It shows that reasonable gymnastics game exercise can significantly enhance the pedaling and stretching ability of children's lower limbs. Exercising children's jumping ability through purposeful and planned physical activities can improve the development level and function of children's cerebral cortex motor center, promote

Table 2. Test results of standing long jump for young children (CM).

Test index	Group		Test one	Test two
Junior class boys	Experience group	Mean	44.23	6814*##
		SD	16.95	16.64
	Control group	Mean	44.10	60.83
		SD	11.83	18 74
Junior class girls	Experience group	Mean	39.76	65.32**##
		SD	14.94	14.48
	Control group	Mean	39.90	57.22
		SD	10. 66	16.05
Middle class boys	Experience group	Mean	64.95	88.79**##
		SD	17.39	18.06
	Control group	Mean	64.83	80.56
		SD	14.81	17.42
Middle class girls	Experience group	Mean	60.04	84.03**##
		SD	17.88	17.09
	Control group	Mean	60.02	74.78
		SD	10 67	14.55
Senior class boys	Experience group	Mean	77.04	108.18**##
		SD	16.18	15.59
	Control group	Mean	77.09	96.74
		SD	17.92	18. 25
Senior class girls	Experience group	Mean	75.97	96.04**##
		SD	15.76	16.13
	Control group	Mean	76.05	89.45
		SD	14.24	14.98

Table 1. Design of gymnastics and game fitness module for kindergarten children in the experimental group.

Modular	Combination mode	Activity content of gymnastics and game fitness module		
		Junior class	Middle age class	Senior class
Module 1	Speed exercises and games	1. Nursery rhymes	1. Walking, running and jumping practice	1. Various walking, running and jumping exercises
		2. Speed operation - dumbbell operation	2. Speed operation	2. Speed operation
		3. Cat catches mouse	3. Batch tail	3. Change the package (round-trip relay run)
Module 2	Strength exercises and games	1. Nursery rhymes	1. Basic practice methods of ball	1. Pattern rolling ball
		2. Strength exercise - bench painting	2. Strength exercises - ball exercises	2. Strength exercise
		3. Dog and bear strike	3. Throwing prey	3. Throw moving target
Module 3	Endurance exercises and games	1. Nursery rhyme	1. Nursery rhymes	1. Walk in line
		2. Endurance exercise	2. Endurance exercise	2. Endurance exercise
		3. Carrots are back	3. Drive the train to drill the mountain	3. I'm a good climber and cross-country athlete
Module 4	Agility exercises and games	1. Colored bead string	1. Step practice	1. Big watermelon and small watermelon
		2. Sensitive operation	2. Sensitive operation	2. Sensitive operation
		3. Little leech mosquito picks up beans	3. Red light and green light stop	3. Zongzi
Module 5	Flexibility exercises and games	1. Limb movement	1. Imitate small animals to walk	1. Pattern walking practice
		2. Flexibility exercise	2. Flexibility exercise	2. Flexibility exercise
		3. The little snail crawls and crawls	3. Game: String sugar gourd	3. Competition between elephants and kangaroos
Module 6	Coordinate exercises and games	1. Follow your mother	1. Limb movement	1. Fast delivery
		2. Coordination operation	2. Coordination operation	2. Coordination operation
		3. Bowling	3. Cross the river to pick flowers	3. Chicken crossing the river

the coordination of body movements, and make the development of children's limb bones stronger and leg muscles more elastic.

From the research results in Figure 1 and Figure 2, it can be seen that during the implementation and intervention of gymnastics game fitness program, the hip joint angle change of young children in the experimental group in the stage of standing long jump and pedaling and stretching has a gradually increasing trend for both men and women. The change range is 53.53°~ 67.58°for boys and 53.41°~ 67.84°for girls, and the changes of boys and girls are basically the same.[7] The increase of hip joint in the gymnastics group was not significantly different from that in the control group.[8]

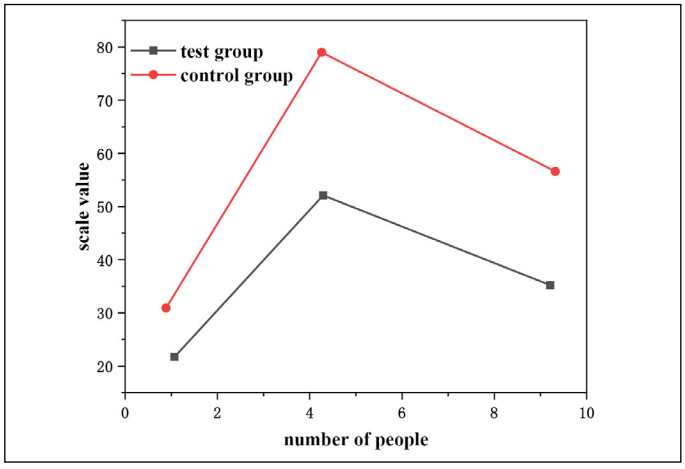

Figure 1. Change of lower limb joint angle (°) of boys in junior children's class during pedaling and stretching stage.

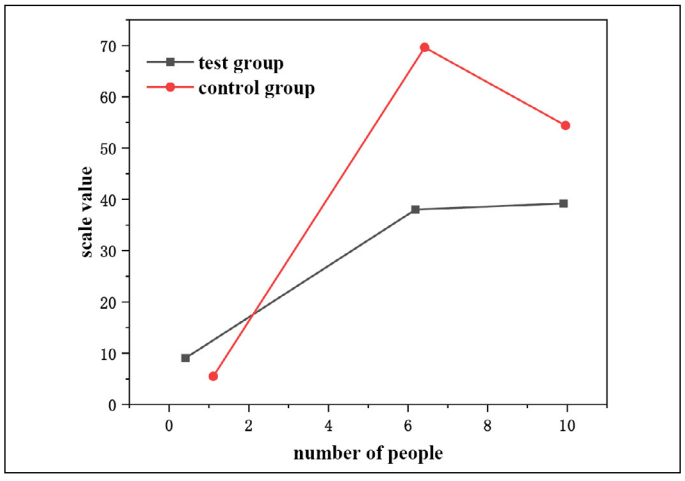

Figure 2. Change of lower limb joint angle (°) of girls in junior children's class during pedaling and stretching stage.

The changes of knee joint indexes are basically consistent with those of hip joint. The variation range of young children in the experimental group is 44.89 ° ~ 55.27 ° for boys and 44.10 ° ~ 55.55 ° for girls. Boys and girls are basically the same. During the intervention period, there was no significant difference in the change results of knee joint angle between the experimental group and the control group ($P > 0.05$), but there were significant differences between boys and girls in the experimental group before and after the intervention ($P < 0.05$). The effect of the intervention on knee joint flexion and extension of girls was stronger than that of boys ($P < 0.01$). It shows that the angle change of knee joint is synchronous with that of hip joint, and there is also a significant increase during fitness intervention. Although the difference was not significant, it did not rule out the influence of gymnastics game fitness program on the change range of children's knee joint angle.[9,10]

During the implementation and intervention of gymnastic game fitness program for children, the ankle angle change of young children in the experimental group in the process of pedaling and stretching has a gradual increasing trend for both men and women. Variation range: 41.59 ° ~ 49.40 ° for boys and 41.59 ° ~ 49.07 ° for girls. Boys and girls are basically the same.[11,12] During the intervention period, there was no significant difference between the experimental group and the control group ($P > 0.05$), but there was significant difference between the experimental group and the girls before and after the experimental intervention ($P < 0.05$), while the difference between boys was not statistically significant, indicating that the range of ankle movement of girls was slightly more affected than boys during the fitness intervention.

CONCLUSION

There are statistical differences in the influence of gymnastics game fitness program intervention on the standing long jump. During the intervention period, there was no significant difference between the experimental group and the control group, but there was significant difference in the change of joint angle between boys and girls in the experimental group before and after the intervention. The analysis shows that the range of motion of hip, knee and ankle of children after gymnastics training is relatively improved, and the influence of intervention on the range of motion of knee joint is stronger than that of hip and ankle, indicating that reasonable gymnastics movement training can significantly change the muscle strength of children's knee extension. With the increase of age and training time, the change range of joint angle of older children in the experimental group was significantly higher than that in the control group.

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: Each author made significant individual contributions to this manuscript. YZ: writing and performing Rehabilitation nursing; YWH: data analysis, article review and intellectual concept of the article; YQ: Conceptualization, Methodology, Software.

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