

EFFECTS OF INTEGRATED SPORTS GAMES ON MOTOR TRAINING OF CHILDREN



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EFEITOS DOS JOGOS ESPORTIVOS INTEGRADOS NO TREINAMENTO MOTOR DE CRIANÇAS

EFFECTOS DE LOS JUEGOS DEPORTIVOS INTEGRADOS EN LA FORMACIÓN MOTRIZ DE LOS NIÑOS

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ABSTRACT

Introduction: The sensorial integration exercise has the goal of stimulating and restoring the disordered perception system, improving proprioception, tactile, audiovisual, and vestibular sensory stimulation, and helping children to improve their perception impairments. The period between three and six is decisive for developing basic motor skills necessary for future sports skills. **Objective:** Studies the impacts of integrated sports game training on children. **Methods:** In a controlled experimental process, 120 children between three and six years old were selected and divided into experimental and control groups. The experimental group was trained in integrated sports games, while the control group did not undergo any intensity training. Their body data were collected and compared before and after the intervention. **Results:** The running index of the experimental group increased from 4.49 ± 1.63 to 4.65 ± 1.53 , the single leg jump increased from 4.39 ± 0.48 to 4.26 ± 0.45 , the step jump increased from 4.28 ± 1.64 to 4.29 ± 1.61 , and the standing jump increased from 4.85 ± 1.74 to 4.84 ± 1.62 , while the data of the control group did not change significantly. **Conclusion:** The training of basic motor skills in children aged 3-6 can be positively impacted by playing sports games integrated into basic motor skills training. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Play Therapy; Motor Skills; Child Rearing.

RESUMO

Introdução: O objetivo do exercício de integração sensorial é estimular e restaurar o sistema de percepção desordenado, melhorar a propriocepção, a estimulação sensorial tátil, audiovisual e vestibular, ajudando as crianças a melhorarem as suas deficiências de percepção. O período compreendido entre os três e seis anos é decisivo para o desenvolvimento de habilidades motoras básicas necessárias a habilidades esportivas futuras. **Objetivo:** Estudar os impactos do treinamento de jogos esportivos integrados em crianças. **Métodos:** No processo experimental controlado, foram selecionadas 120 crianças entre 3 a 6 anos de idade, divididas em grupo experimental e controle. O grupo experimental foi treinado em jogos esportivos integrados, enquanto o grupo de controle não foi submetido a nenhum treinamento de intensidade. Seus dados corporais foram coletados e comparados antes e após a intervenção. **Resultados:** O índice da corrida do grupo experimental aumentou de $4,49 \pm 1,63$ para $4,65 \pm 1,53$, o salto de perna única elevou-se de $4,39 \pm 0,48$ para $4,26 \pm 0,45$, o salto de passo aumentou de $4,28 \pm 1,64$ para $4,29 \pm 1,61$, e o salto em pé subiu de $4,85 \pm 1,74$ para $4,84 \pm 1,62$, enquanto os dados do grupo de controle não sofreram alterações significativas. **Conclusão:** O treinamento de habilidades motoras básicas em crianças de 3-6 anos de idade pode ser impactado positivamente através da realização de jogos esportivos integrados no treinamento de habilidades motoras básicas. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Ludoterapia; Destreza Motora; Educação Infantil.

RESUMEN

Introducción: El objetivo del ejercicio de integración sensorial es estimular y restaurar el sistema de percepción desordenado, mejorar la propiocepción, la estimulación sensorial táctil, audiovisual y vestibular, ayudando a los niños a mejorar sus deficiencias perceptivas. El período comprendido entre los tres y los seis años es decisivo para el desarrollo de las habilidades motrices básicas necesarias para las futuras capacidades deportivas. **Objetivo:** Estudiar los impactos del entrenamiento con juegos deportivos integrados en los niños. **Métodos:** En un proceso experimental controlado, se seleccionaron 120 niños de entre 3 y 6 años, divididos en grupo experimental y grupo de control. El grupo experimental fue entrenado en juegos deportivos integrados, mientras que el grupo de control no fue sometido a ningún entrenamiento de intensidad. Se recogieron sus datos corporales y se compararon antes y después de la intervención. **Resultados:** El índice de carrera del grupo experimental aumentó de $4,49 \pm 1,63$ a $4,65 \pm 1,53$, el salto con una sola pierna aumentó de $4,39 \pm 0,48$ a $4,26 \pm 0,45$, el salto de paso aumentó de $4,28 \pm 1,64$ a $4,29 \pm 1,61$, y el salto de pie aumentó de $4,85 \pm 1,74$ a $4,84 \pm 1,62$, mientras que los datos del grupo de control no cambiaron significativamente. **Conclusión:** El entrenamiento de las habilidades motrices básicas en niños de 3 a 6 años puede tener un impacto positivo mediante la realización de juegos deportivos integrados en el entrenamiento de las habilidades motrices básicas. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Ludoterapia; Destreza Motora; Crianza del Niño.



INTRODUCTION

Children's stage is an important period of movement development and skill training, and also a key period of basic movement ability development, which has a great role in promoting the development of sports ability in the future.¹ Sports games are children's favorite activities. The purpose of sensory integration exercise is to stimulate and restore the disordered perception system, improve proprioception, tactile, audio-visual and vestibular sensory stimulation, and help children improve their perception deficiencies. Using the way of playing games can improve the development of human body balance function.² This paper will incorporate sensory integration exercise into sports games, intervene children aged 3-6, explore how the integrated exercise method can effectively improve children's basic exercise ability, and provide theoretical and practical reference basis for the integrated sports games used in the education of children aged 3-6. Coordination ability refers to the degree of dynamic coordination of different parts of the human body in the process of sports.³ It is one of the key forces of human beings, and also one of the main indicators to evaluate the level of children's sports growth in early childhood. Sports injury during this period will have a negative impact on children's daily activities and academic performance.⁴ Mild and moderate limb movement dysfunction will not seriously affect children's final motor development results, but children often suffer from lack of finger flexibility, poor ability to maintain balance, and poor limb coordination in ball games. Games are children's favorite type of sports.⁵ Sensory integration training promotes children's exercise synergy through stimulating and restoring the disordered motion perception system, and takes the form of games as the carrier. By integrating sensory integration exercise into sports games, this paper implements sports intervention for children aged 3-6 years, and discusses how to effectively improve the synergy of children's basic motor skills after integrating into sports games, which provides theoretical basis and practical reference basis for promoting and improving the sports education of children aged 3-6 years.⁶

METHOD

Research object

In this paper, 40 children aged 3-4 years old, 40 children aged 4-5 years old, and 40 children aged 5-6 years old were selected as the experimental subjects. A total of 120 children aged 3-6 years old were tested for the basic body system. The study and all the participants were reviewed and approved by Ethics Committee of Mudanjiang Normal University (NO. MDJNU-PT076). The selected experimental subjects had no significant differences in various indicators. The average age of the subjects is 3-6 years old, the height is about 103cm-113cm, and the weight is 16kg-20kg. The 120 children were allocated according to the age of 3-4, 4-5 and 5-6, and then divided into two groups, the experimental group and the control group, for a period of 8 weeks to develop sports game mobile skills and sports game ball control skills. The experimental group was trained for 8 weeks in integrated sports games. The control group was trained as usual. During the 8-week experiment, 120 children aged 3-4 years old maintained normal living habits. The specific conditions of the experimental objects are shown in Table 1.

Table 1. Basic physical condition of children aged 3-6.

Age	Gender	Age (years)	Height (cm)	Body weight (kg)	BMI
3-4 years old (small class)	Male	3.36±0.283	103.24±3.110	16.70±1.656	16.54±1.373
	Female	3.34±0.240	102.81±4.011	15.58±2.697	15.28±1.965
4-5 years old (middle class)	Male	4.35±0.317	110.56±4.367	19.51±3.022	15.66±1.970
	Female	4.50±0.284	108.33±5.154	17.91±2.188	14.88±1.019
5-6 years old (senior class)	Male	5.49±0.286	117.20±5.390	22.64±4.405	15.94±1.922
	Female	5.57±0.259	113.02±4.467	20.05±4.387	14.77±1.448

Experimental method

During the eight-week experiment, different training forms were adopted for the children in the experimental group and the control group. First, 40 children in each group should be sorted before training, and the basic motor skills should be trained according to the order. During the experiment, the physical condition of the children after training should be recorded by professional equipment, and the information should be summarized after the experiment for subsequent analysis and summary. At the end of the experiment, compare the experimental information of children with the basic information before the experiment, and also compare the experimental information of basic motor skills of children in the experimental group and the control group, so as to analyze the effect of integrated sports games on the cultivation of basic motor skills of children aged 3-6.

Before the experiment, the scoring status of the basic movement skills of the subjects was analyzed. Table 2 shows the classification of the experimental items. The items of the movement skills include running, horse running, single foot jumping, step jumping, standing long jump and side sliding, while the ball control skills include, two-handed hitting the fixed ball, one-handed forehand hitting the rebound ball, one-handed in-place racket, two-handed catching, kicking the fixed ball, upper-hand throwing and low-hand throwing.

Mobile skills are the main training items for training the basic motor skills of children aged 3-6 years old. They are collectively referred to as various running and jumping movements used to change the position, direction, speed and height. It is the basis of basic movement training, and also the most used basic movement in basic movement training.

RESULTS

Table 3 shows the training effect indicators of mobile skills of children aged 3-6 before and after the experiment.

Table 2. The present situation of the scoring of the basic motor skills of the subjects before the experiment.

	Project	Male	Female	T	P
Mobile skills	Run	7.59±0.808	7.62±0.990	1.1380	0.9432
	Horse trot	4.26±2.757	4.15±2.982	0.5897	0.5923
	Jump on one foot	3.69±2.794	4.18±2.825	-1.6989	0.5780
	Step jump	1.81±2.350	2.88±2.437	-3.9423	0.8117
	Standing long jump	5.15±2.104	4.89±2.150	0.7341	0.6048
	Side step	6.17±2.656	6.42±2.279	-1.5637	0.9771
Ball control skills	Two-handed fixed ball	5.26±2.565	5.48±2.292	-0.4123	0.6072
	Single-handed forehand rebound	1.96±2.157	1.89±2.178	0.4665	0.9675
	Single-handed racket in place	1.77±2.011	1.83±2.109	-0.3286	0.6872
	Catch the ball with both hands	3.04±1.317	2.87±1.418	1.1305	0.7192
	Kick the fixed ball	5.25±1.946	4.52±2.061	2.8441	0.5438
	Overhand pitch	3.25±2.368	2.80±2.330	1.3147	0.7932
	Underhand throw	3.16±2.840	2.83±2.529	1.2742	0.7087

By comparing the data of the basic movement skills of the 3-6-year-old children in the experimental group before and after the experiment, it can be found that the basic movement skills of the 3-6-year-old children have significantly improved after the 12-week training of integrated sports games. Single-legged jump and sideslip have been significantly improved. At the same time, the P value of horse run is the highest. Compared with the data of the basic motor skills of 3-6-year-old children in the control group before and after the experiment, there was no significant difference in the basic motor skills of 3-6-year-old children in the control group before and after the experiment, and even there was a decline in some aspects, such as the most obvious decline in the value of sideslip. By comparing the data of the 3-6-year-old children in the experimental group and the control group after the experiment, it can be found that the 3-6-year-old children who have been trained in integrated sports games are significantly better than the control group in terms of basic motor skills after the experiment, with significant differences.

It can be seen from Figure 1 that the training effect of children aged 3-6 years old when playing integrated sports games should always keep their body in motion when playing integrated sports games. When playing sports games, in the experimental group, the value change of the horse race item before and after the experiment is the smallest, while the value of the step jump item before and after the experiment is relatively obvious. The changes in the values of various sports in the control group before and after the experiment are not obvious, so the values of the corresponding experimental group before and after the experiment are only increased by 0.66, while the values of the experimental group that

Table 3. Effects of integrated sports games on the development of mobile skills of children aged 3-6.

Time	Project	Experience group	Control group	P
Before experiment	Run	6.12±0.646	6.11±0.767	0.8045
	Horse trot	4.49±1.638	4.65±1.537	0.9843
	Jump on one foot	4.39±0.485	4.26±0.458	0.9100
	Step jump	4.28±1.641	4.29±1.618	0.5811
	Standing long jump	4.85±1.748	4.84±1.625	0.7585
	Side step	6.24±1.731	6.19±1.722	0.9515
	After experiment	Run	6.26±0.465	6.31±1.696
Horse trot		4.49±0.519	4.72±0.499	0.0018
Jump on one foot		4.59±0.515	4.26±0.458	0.0205
Step jump		4.61±0.496	4.63±0.519	0.0232
Standing long jump		4.85±0.929	4.97±1.744	0.0007
Side step		6.51±0.507	6.19±0.598	0.0163

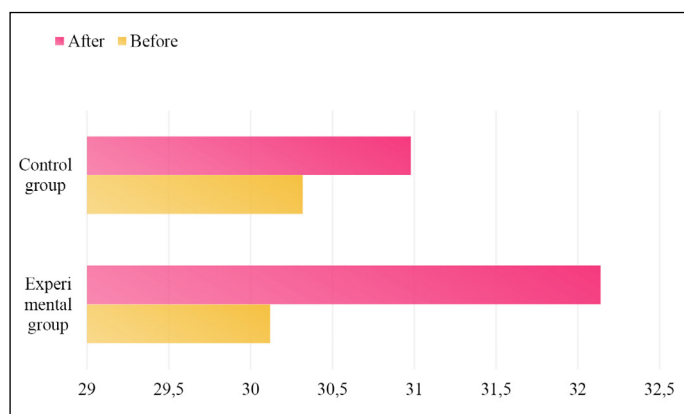


Figure 1. Effects of integrated sports games on the development of mobile skills of children aged 3-6.

has carried out fusion sports games before and after the experiment are increased by 2.02. From the bar chart, it can also be seen that the actual values of the control group are not significantly improved.

Table 4 shows the effect changes of ball control skills of 3-6-year-old children's integrated sports games before and after the experiment. The most obvious changes of ball control skills include: two-handed fixed ball, one-handed forehand rebound, and upper-handed pitches. Before the experiment, the data of two-handed hitting fixed ball in the experimental group was 4.39 ± 1.525 , and after the experiment, the data of two-handed hitting fixed ball in the experimental group was 6.72 ± 1.313 . Before the experiment, the single-handed forehand rebound data of the experimental group was 3.44 ± 1.518 , and after the experiment, the single-handed forehand rebound data of the experimental group was 5.94 ± 0.759 . Before the experiment, the data of overhand pitches in the experimental group was 3.94 ± 1.731 , and after the experiment, the data of overhand pitches in the experimental group was 4.55 ± 0.637 .

The time in the bar chart in Figure 2 is divided into two periods before and after the experiment. The experiment is divided into two groups: the experimental group and the control group. The problem of the overall evaluation of fusion sports games on the changes of basic motor skills of children aged 3-6 is analyzed. When the experimental group is conducting the experiment, the value before the experiment is

Table 4. Effects of integrated sports games on ball control skills of children aged 3-6.

Time	Project	Experience group	Control group	P
Before experiment	Two-handed fixed ball	4.39±1.525	4.55±1.535	0.9795
	Single-handed forehand rebound	3.44±1.518	3.43±0.519	0.5466
	Single-handed racket in place	3.98±1.684	4.07±0.696	0.9055
	Catch the ball with both hands	3.23±0.709	3.24±0.589	0.6084
	Kick the fixed ball	5.18±1.620	4.84±0.733	0.6795
	Overhand pitch	3.94±1.731	3.95±1.783	0.5739
	Underhand throw	4.90±1.730	5.20±1.620	0.5237
After experiment	Two-handed fixed ball	6.72±1.313	4.55±1.535	0.0173
	Single-handed forehand rebound	5.94±0.759	3.43±1.537	0.0285
	Single-handed racket in place	4.12±1.575	4.07±1.582	0.0015
	Catch the ball with both hands	3.75±1.702	3.24±1.588	0.0241
	Kick the fixed ball	5.18±0.632	4.90±1.684	0.0345
	Overhand pitch	4.55±0.637	3.95±1.783	0.0178
	Underhand throw	4.97±0.662	5.20±1.620	0.0317



Figure 2. Overall evaluation of the changes of basic motor skills of children aged 3-6 years old by integrated sports games.

29.21, and the value after the experiment is increased to 32.34, The value before and after the experiment increased by 3.13, while the data of the control group before and after the experiment was 29.23, the data after the experiment increased to 30.12, and the value before and after the experiment increased by 0.89. Therefore, through the analysis of the bar chart, we can see that the value of the experimental group and the control group before and after the experiment has been improved, of which the value of the experimental group before and after the experiment is more obvious, while the value of the control group is relatively less.

DISCUSSION

Sports games are an active way generally accepted by children, with multiple functions of leisure and exercise. Children can express their emotions in sports by participating in sports games, which plays a very important role in the development of children's physique and the establishment of mental health. The three key points of children's sports are education, games and sports, so the role and significance of sports in children's education are the main issues we need to understand at present. With the gradual weakening of children's initiative to participate in sports games, overall sports activities are gradually reduced, and static items are significantly increased. At present, more attention is paid to the safety of sports. Constant sports training methods are not conducive to children's diversified sports experience and physical development. We should pay more attention to children's interests, monitor sports in children's sports games, implement physical exercise in children's games, and effectively combine children's games with physical exercise. Sports games play a certain role in promoting the development of children's physical fitness. Due to the short intervention time, the effect after the experiment is not obvious. Different ages and genders also have obvious differences in the effects of coordination quality and flexibility quality.

CONCLUSION

Integrative sports games are an effective way to train children's basic movement skills. Children's proficiency in basic movements is also the basis of all skills. Therefore, it must develop with them in all aspects, not in isolation. The performance of basic sports that can be observed in sports games is based on outstanding sports ability. In education, people have long recognized that motor skills are an essential prerequisite and basis for children's basic physical movement. Motion cybernetics basically establishes the basic relationship between the professional knowledge of basic motor skills and its application in various specific sports situations. Most specific sports and motor skills are modifications of basic motor skills. The research of motor skills is a gradual process, which makes people prepare for more difficult and more specific skills than previously acquired motor skills. Stable motor skills and perfect target control skills will become the basis of most motor specific skills and actions.

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