

# FUNCTIONAL TRAINING REHABILITATION IN A LATIN DANCE INJURY



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REABILITAÇÃO COM TREINAMENTO FUNCIONAL EM LESÃO OCASIONADA POR DANÇA LATINA

REHABILITACIÓN CON ENTRENAMIENTO FUNCIONAL EN LESIÓN CAUSADA POR DANZA LATINA

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## ABSTRACT

**Introduction:** Latin dance is an emerging sport with rapid popularization in China. Along with the increase of world competitions in Latin dance, its rules are in constant progress demanding high motor coordination and balance skills from the athlete. In an attempt to keep up with the quality required by international competitions, rehabilitation must also be innovated. **Objective:** Explore the application of functional rehabilitation training to ankle injuries in Latin dance dancers. **Methods:** 65 athletes from a Latin dance club were selected as subjects and divided into research and control groups, with 33 and 32, respectively. The control group received the same daily training, while the study group was added a specific protocol involving rehabilitation with functional training. Functional indices were categorized, subjective analysis and pain were collected before and after the intervention. **Results:** The results showed that the pain score of the study group went from  $5.71 \pm 0.49$  to  $2.21 \pm 0.19$ , while the control group started with  $5.69 \pm 0.41$  ending at  $4.78 \pm 0.31$  after training. There was no significant difference in the visual analog pain scale score between the two groups before training ( $P > 0.05$ ). **Conclusion:** Functional training rehabilitation can improve the rate of exercise in ankle injuries on Latin dance practitioners. **Evidence Level II; Therapeutic Studies - Investigating the result.**

**Keywords:** Dance Therapy; Physical Functional Performance; Ankle Injuries.

## RESUMO

**Introdução:** A dança latina é um esporte emergente com rápida popularização na China. Juntamente com o aumento das competições mundiais de dança latina, suas regras de estão em constante progresso exigindo altas habilidades de coordenação motora e equilíbrio do atleta. A reabilitação também deve ser inovada para acompanhar a qualidade requerida pelos padrões das competições internacionais. **Objetivo:** Explorar a aplicação do treinamento de reabilitação funcional em lesões no tornozelo de dançarinos da dança latina. **Métodos:** 65 atletas de um clube de dança latina foram selecionados como sujeitos e divididos em grupos de pesquisa e grupos de controle, com 33 e 32, respectivamente. O grupo de controle recebeu o mesmo treinamento cotidiano, enquanto ao grupo de estudo foi acrescentado um protocolo específico envolvendo reabilitação com treinamento funcional. Índices funcionais foram categorizados e análise subjetiva e dor também foi coletada antes e após a intervenção. **Resultados:** Os resultados mostraram que a pontuação da dor do grupo de estudo foi de  $5,71 \pm 0,49$  para  $2,21 \pm 0,19$ , enquanto o grupo de controle iniciou com  $5,69 \pm 0,41$  finalizando em  $4,78 \pm 0,31$  depois do treinamento. Não houve diferença significativa na pontuação da escala visual analógica de dor entre os dois grupos antes do treinamento ( $P > 0,05$ ). **Conclusão:** A reabilitação com treinamento funcional pode melhorar a taxa de reabilitação para exercícios no público praticante de dança latina com lesões no tornozelo. **Nível de evidência II; Estudos Terapêuticos - Investigação de Resultados.**

**Descritores:** Terapia através da Dança; Desempenho Físico Funcional; Lesões do Tornozelo.

## RESUMEN

**Introducción:** El baile latino es un deporte emergente con una rápida popularización en China. Junto con el aumento de las competiciones mundiales de bailes latinos, sus reglas están en constante progreso exigiendo al atleta una gran coordinación motora y habilidades de equilibrio. La rehabilitación también debe ser innovadora para estar a la altura de la calidad exigida por las normas de las competiciones internacionales. **Objetivo:** Explorar la aplicación del entrenamiento de rehabilitación funcional en las lesiones de tobillo en los bailarines de danza latina. **Métodos:** Se seleccionaron 65 atletas de un club de baile latino como sujetos y se dividieron en grupos de investigación y de control, con 33 y 32, respectivamente. El grupo de control recibió el mismo entrenamiento diario, mientras que al grupo de estudio se le añadió un protocolo específico de rehabilitación con entrenamiento funcional. Se clasificaron los índices funcionales y también se recogió el análisis subjetivo y el dolor antes y después de la intervención. **Resultados:** Los resultados mostraron que la puntuación de dolor del grupo de estudio pasó de  $5,71 \pm 0,49$  a  $2,21 \pm 0,19$ , mientras que el grupo de control empezó con  $5,69 \pm 0,41$  y terminó con  $4,78 \pm 0,31$  después del entrenamiento. No hubo diferencias significativas en la puntuación de la escala analógica visual del dolor entre los dos grupos antes del entrenamiento ( $P > 0,05$ ). **Conclusión:** La rehabilitación con entrenamiento funcional puede mejorar el índice de rehabilitación para el ejercicio en practicantes de baile latino con lesiones de tobillo. **Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.**

**Descriptorios:** Terapia a través de la Danza; Rendimiento Físico Funcional; Traumatismos del Tobillo.



## INTRODUCTION

Latin dance is an emerging sport, which has developed very rapidly in China in recent years. With the increase of Latin dance world competitions, the competition rules of Chinese Latin dance are constantly evolving, and now it has been fully in line with international events.<sup>1</sup> According to the competition rules of the World Sports Dance Federation (WDSF), the new evaluation standard has five elements: posture and balance, including body posture, body line, shape, body holding and posture design, body position and change; dynamic balance and static balance, personal balance and double balance.<sup>2</sup> Action quality, including universal action, style action and action mobility, center of gravity movement, time value of action and space of action. The musicality of action includes the time value of action, the rhythm of action, the rhythmic structure of action, the sense of movement, the distribution of time value of action and the musical expression of action. Double cooperation skills, including connection with body contact, communication without body contact, suitable and appropriate double cooperation, effective double cooperation technology and consistency (adhesion) of double cooperation. Choreography and performance, including well-balanced choreography, dance atmosphere, dance creativity, dance expression and dance interpretation.<sup>3</sup> The ankle joint of Latin dancers is an important weight-bearing joint of lower limbs. It transforms the vertical gravity of the human body into the weight-bearing of bow structure. When the ankle joint can not be effectively buffered by external reaction force, it is very easy to be damaged. Common Latin dance ankle injuries include fractures and ligament injuries. If not treated properly, traumatic arthritis is easy to occur, and ankle functional exercise is particularly important. Through active or passive training, exercise therapy enables patients to recover their whole or local motor function and sensory function. It is also an important rehabilitation method to improve the motor function of ankle joint. According to the power source, exercise therapy can be divided into active exercise and passive exercise. The functional training of ankle includes ankle muscle strength training, endurance training, balance training, proprioception training and so on. Aiming at this research problem, Jiang C and others believe that medical exercise therapy is an important part of exercise therapy. Based on evidence-based medicine, they emphasize the recovery of patients' neuromuscular conduction system through active participation and precise control of strength and balance training.<sup>4</sup> Based on the current research, in order to explore the application of functional rehabilitation training in Latin dance ankle injury, 65 athletes with ankle injury in a Latin dance club were selected as subjects and divided into research group and control group, with 33 and 32 people respectively.<sup>5</sup> The results show that the clinical treatment of Latin dance ankle injury with functional rehabilitation training can effectively alleviate the symptoms such as ankle pain, accelerate the recovery of the injured part, and greatly improve the clinical cure rate and treatment effect. Therefore, it should be widely used and popularized in clinic.<sup>6</sup>

## METHOD

### Basic data

In this study, 65 athletes with ankle injury were selected from a Latin dance club. The selected patients were randomly divided into study group and control group. There were 33 cases and 32 cases in the two groups respectively. There were 18 males and 15 females in the study group; The age range was 20-45 years, with an average of (32.61 ± 9.31) years; There were 16 males and 16 females in the control group; The age range was 21-43 years, with an average of (31.75 ± 9.29) years; See Table 1 for basic data. Comparing the sex ratio and age of the two groups, there was no significant difference between the two groups ( $P > 0.05$ ).

Table 1. General information.

Group	Number of cases	Male	Female	Average age
Research Group	33	18	15	(32.61 ± 9.31)
Control group	32	16	16	(31.75 ± 9.29)

### Test method

The control group was trained normally, and the study group was treated with functional rehabilitation training.

Rehabilitation training methods:

Squatting, 3 times a day for 2 minutes each time, is used to evaluate the symmetry and functional flexibility and stability of hip, knee and ankle, as well as the symmetry and functional flexibility and stability of shoulders, acromion and thoracic vertebrae.

Hurdle step: used to evaluate the flexibility and stability of hip, knee and ankle.

Front and back split squat: used to evaluate the flexibility and stability of hip, knee and ankle joints, as well as the stability of spine and the flexibility of multi joint muscles.

### Observation indicators

Pain score: VAS: the total score ranges from 0 (painless) to 10 (severe and unbearable pain). The higher the score, the stronger the pain [7]. The score is 1 ~ 3, which means mild pain; 4 ~ 6 points: moderate pain; 7 ~ 9 points are extreme pain.

Ankle function: assessed by kofoed scale, the scale is divided into three dimensions: pain, function and mobility, with full scores of 50, 30 and 20 respectively. The total score of the scale is 100, 85-100 is excellent, 75-85 is good, 70-74 is qualified, and less than 70 is poor. Excellent and good rate of ankle function = (excellent + good) / total number of cases × 100%.

Quality of life: SF-36 health brief form is used to evaluate the quality of life of athletes. The total score of each score is 100. The higher the score, the better the quality of life.

### Statistical methods

Use spss23 0 analysis, the measurement data are expressed in (xs) by t-test, and the counting data are expressed in (%) by t-test. The difference is statistically significant ( $P < 0.05$ ).

## RESULTS

### Compare the pain scores of the two groups

The results showed that there was no significant difference in VAS score between the two groups before training ( $P > 0.05$ ). After training, the VAS score of patients in the study group was lower than that in the control group ( $P < 0.05$ ). (Figure 1)

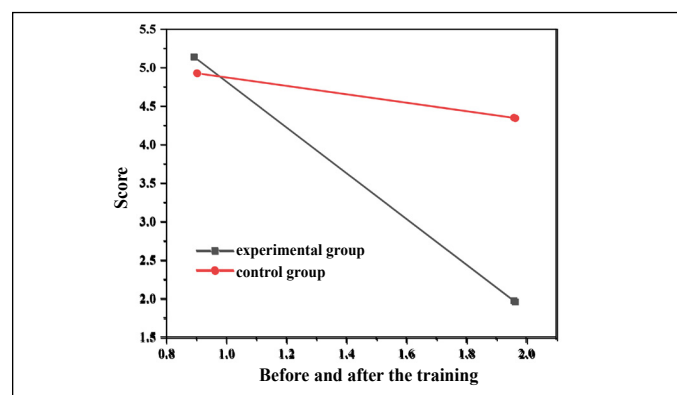


Figure 1. Comparison of pain scores between the two groups.

## Compare the excellent and good rate of ankle function between the two groups

See Table 2. The results show that the excellent and good rate of ankle function in the study group is significantly higher than that in the control group ( $P < 0.05$ ).

## Compare the quality of life scores of the two groups

The results showed that the SF-36 score of the study group was higher than that of the control group ( $P < 0.05$ ). (Table 3)

**Table 2.** Compare the excellent and good rate of ankle function between the two groups.

Group	Excellent	Good	Qualified	Difference	Excellent rate
Research Group	18	13	2	0	30
Control group	14	11	4	3	24
$\chi^2$	-	-	-	-	10.389
P	-	-	-	-	0.001

**Table 3.** Comparison of quality of life scores between the two groups.

Project	Research Group	Control group	t	P
physiological function	87.23	81.53	3.075	0.003
Physiological function	85.36	81.58	2.989	0.005
Physical pain	84.53	80.21	3.540	0.001
General health status	85.86	80.51	3.405	0.001

## DISCUSSION

Latin dance is a sport with technology as the core. Among the many factors to win the competition, the technical level of athletes is the most important factor. It is also the first factor for referees to consider when judging sports results. Today's Latin dance competition requires more and more high-quality movements and highlights the value of difficulty. Action is the carrier of technology, and improving the quality of action is the key to improve technology.<sup>8</sup> Many athletes pay too much attention to the visual effect and quantity presented by the movement in the training process, but do not pay attention to the quality of the movement. As a result, there will only be wrong force generation mode, wrong movement track and wrong movement posture, forming bad movement mode and unnecessary loss of ability.<sup>9</sup> At the same time, these problems are also the root cause of athletes' physical joints and muscle injuries. On this basis, it is emphasized that quantitative training will only train poor movement patterns, and poorly trained movement patterns can only strengthen poor quality movements, and pose a greater risk of injury. Latin dancers should pay attention to the training of movement quality, establish excellent movement mode, strengthen the effectiveness and economy of movement, and reduce unnecessary energy loss, so as to promote the growth of athletes' sports technology

and improve competition results. The part of functional rehabilitation training is mainly to train complete movements, that is, movement patterns, rather than training each single and different muscle. If we train the muscles, we will forget the training movements. If we train the movements, the muscles will also be trained. Functional rehabilitation training focuses on multi joint and multi plane movement training, and this training is more in line with the needs of sports environment. Because the real motion environment requires multiple motion planes for the body. The purpose of our training is to improve the ability required by athletes' special skills. Functional movement training emphasizes the training of movement posture and power chain. Traditional strength training does not pay much attention to the high quality of movement, which virtually reduces the requirements for the quality of movement mode. As we all know, the actual environment of competitive sports is carried out in a dynamic and challenging environment, which requires the participation and integration of the power chain, while the traditional strength practice lacks the practice of the power chain, which is contrary to the actual competitive sports environment. In recent years, people pay attention to the improvement of health level, and more and more people participate in sports. As an important weight-bearing structure in sports, ankle is very easy to be injured in inappropriate sports. Many patients with ankle injury do not pay attention to this, resulting in old ankle sports injury. Rehabilitation training can promote the recovery of patients' ankle function, but the old ankle sports injury belongs to "arthralgia". Rehabilitation training does not significantly improve the obstruction of meridians and Qi and blood. In this study, compared with the control group, the VAS score of the study group was lower, and the excellent and good rate of ankle function and quality of life score SF-36 were higher. Based on the routine training of the control group, the study group combined with functional rehabilitation training, which can improve the stability of ankle joint and promote the recovery of local sensory function.

## CONCLUSION

This paper puts forward the application of functional rehabilitation training in Latin dance ankle injury. The results show that the clinical treatment of Latin dance ankle injury with functional rehabilitation training can effectively alleviate the symptoms such as ankle pain, accelerate the recovery of the injured part, and greatly improve the clinical cure rate and treatment effect. Therefore, it should be widely used and popularized in clinic. In the future, it is suggested to continue the research on the strength, speed and endurance of Latin dance athletes, and constantly improve and perfect the methods and means of Latin dance physical function training.

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

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**AUTHORS' CONTRIBUTIONS:** Each author made significant individual contributions to this manuscript. XS: writing and performing surgeries; JC: data analysis, performing surgeries, article review and intellectual concept of the article.

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