



## Goalball and its relationship with the development of physical strength and inclusion processes in women with visual disabilities

### Goalball y su relación con el desarrollo de fuerza física y procesos de inclusión en mujeres con discapacidad visual

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#### Abstract

**Introduction:** Specific training in Goalball highlights that individual performance factors and the focus on aerobic and anaerobic metabolism can improve athletes' performance and reaction time in this sport. **Objective:** To characterize the practice of Goalball and analyze its association with the development of physical strength and social inclusion processes in women with visual disabilities. **Methodology:** This descriptive research reveals that specific approaches were adopted in the training of Goalball athletes, allowing for the analysis of the effectiveness of the methods used and identifying areas for improvement to optimize sports performance. **Results:** The findings indicate that the practice of Paralympic sports, such as Goalball, significantly enhances the physical capacity and social inclusion of women with visual disabilities, demonstrating the effectiveness of adapted training programs. **Discussion:** It emphasizes that, despite the significant achievements in the physical performance of women with visual disabilities through

Goalball, it is essential to continue developing adapted training programs that address the identified areas for improvement.

**Keywords:** Goalball, Physical activity, strength, inclusion.

#### Resumen

**Introducción:** El entrenamiento específico en Goalball, destaca los factores individuales de rendimiento y el enfoque en el metabolismo aeróbico y anaeróbico, pueden mejorar el desempeño y el tiempo de reacción de los atletas en este deporte. **Objetivo:** Caracterizar la práctica del goalball y analizar su asociación con el desarrollo de la fuerza física y los procesos de inclusión social en mujeres con discapacidad visual. **Metodología:** esta investigación descriptiva revela que se adoptaron enfoques específicos en el entrenamiento de los atletas de Goalball, permitiendo analizar la efectividad de los métodos utilizados y señalar áreas de mejora para optimizar el rendimiento



deportivo. Resultados: Los resultados indican que la práctica de deportes paralímpicos, como el Goalball, mejora significativamente la capacidad física de fuerza y la inclusión social de las mujeres con discapacidad visual, evidenciando la efectividad de programas de entrenamiento adaptados. Discusión: Resalta que, a pesar de los logros significativos en el rendimiento físico de las mujeres con discapacidad visual a través del Goalball, es fundamental continuar desarrollando programas de entrenamiento adaptados que aborden las áreas de mejora identificadas.

**Palabras claves:** Goalball, Actividad física, fuerza, inclusión

### Introduction

Goalball provides women with visual impairments with an inclusive space that fosters their personal empowerment and physical development. This sport not only improves their physical condition, agility, and coordination, but also facilitates social interaction, which is crucial in a collective environment where communication and cooperation are essential (Avalos et al. 2021).

Strength training is fundamental for all athletes, regardless of the presence or absence of a disability. In women with visual impairments, strength training can have positive effects on their self-perception of social and educational inclusion. The self-perception of social and educational inclusion for women with

visual impairments is fundamental for the development of healthy life processes.

Strength training positively influences the performance of Goalball players. Through targeted muscle training, playing skills such as speed, agility, and endurance can be improved. Furthermore, this type of training promotes inclusion in the sport, as players with different physical abilities can participate and excel. Ultimately, making the body stronger not only improves performance but also creates an inclusive environment where everyone can excel.

Goalball not only provides physical benefits but also helps challenge social stereotypes and improve the visibility of women with disabilities. In this way, it is a tool for their social inclusion and for strengthening their self-esteem in society (Moreno, 2021). Physical activity, exercise, and play strengthen physical abilities and improve performance in daily activities, leading to greater autonomy in daily life (Fernández & Álvarez, 2024).

Created during World War II to rehabilitate blind soldiers, Goalball fosters friendship and socialization. Furthermore, it is essential for combating sedentary lifestyles, which often lead to health problems such as obesity, compared to people of the same age without disabilities (Domínguez et al., 2022).



By engaging in this activity, women not only improve their mobility and muscle strength, but also develop confidence and discipline, which benefit their daily lives and contribute to their emotional well-being (Santana et al., 2005; Santana et al., 2002). Goalball promotes independence and awareness of women's capabilities, which is essential for social inclusion, especially when many are going through a cycle of inactivity that threatens their well-being (Caballero & Aguilar, 2020).

Physical strength is fundamental to achieving athletic success, but those with disabilities may not be able to develop their strength in a similar or as effective way as someone without a disability.

But above all, beyond the physical aspect, Goalball aims to help women build self-confidence and face life with joy and assurance. The Ecuadorian Sports Federation for the Blind (FEDEDIV) is interested in forming women's teams and national teams because Goalball offers opportunities for people seeking an activity to occupy their free time (Caballero & Aguilar, 2020).

Social inclusion is achieved through the friendships and emotional bonds that develop in competitions.

Women with visual impairments are frequently trapped in a cycle of physical inactivity that deteriorates their health. The lack of adapted sports facilities and inclusive programs restricts their participation in activities necessary for their physical, emotional, and social well-being (Osorio et al., 2017). This inactivity generates health problems and greater social exclusion, and negative perceptions about their physical abilities can discourage them and make them feel invisible (Gómez et al., 2007).

For these players, Goalball provides a pathway to sport, creating a network of group support (Scherer et al., 2012).

Psychological characteristics, such as self-esteem and confidence, are essential for achieving success in any area of life and are especially relevant when developing a training program in this discipline for women with visual impairments (Petrigna et al., 2020).

The main objective of this research is to analyze how Goalball affects the physical capacity and social inclusion of these women, highlighting the emotional and physical benefits of its practice and the challenges they face on their path to integration and empowerment (Romero, 2025). Goalball is not only a sport but also



a tool for improving physical strength and promoting the social inclusion and personal development of women with visual impairments.

### Materials y Methods

El estudio se realiza de tipo no experimental con un enfoque descriptivo para comprender las características y habilidades de las participantes.

#### *Participants*

The study population consists of 25 visually impaired women who play goalball. These women are between 34 and 47 years old, train regularly at FEDEDIV, and are in good physical condition.

The non-probability sample included 20 athletes who train regularly at FEDEDIV and are in good physical condition.

#### *Technique and Instruments*

Their muscle strength will be assessed using 1RM tests. Each participant will perform an appropriate warm-up followed by a standardized protocol to determine their 1RM for each selected exercise. The results will be documented in a frequency table that evaluates performance in four categories: cuatro categorías:

**Table 1**

R	Rating Scale
1	Excellent
2	Good
3	Regular
4	Needs improvement

Own elaboration

Finally, the results will be discussed in the context of existing literature, identifying the benefits and challenges faced by the participants, as well as recommendations for future research in the field of adapted sport.

### Results

This section presents the results of strength tests conducted on 20 blind women who play Goalball. Three main exercises were analyzed: Bench Press, Squat, and Military Press, using the One Repetition Maximum (1RM) as the measure of strength. The results will be classified into four performance levels: Very Good, Good, Fair, and Needs Improvement. This classification will allow for a comparison that not only shows the athletes' current physical condition but also identifies areas for improvement. Through this evaluation, the aim is to understand how Goalball influences the physical capabilities of these



women and to provide a basis for future interventions and training programs tailored to their needs.

**Table 2**

<b>PRESS DE BANCA (MUJERES)</b>	
Excellent	+45 kg
Good	35 – 44 kg
Regular	25 – 34 kg
Needs improvement	< 25 kg

**Elaboración propia**

**Table 3. Bench Press Results**

				Percentage	Cumulative
		Frequency	Percentage	Valid	Percentage
Valid	Excellent	4	20,0	20,0	20,0
	Good	9	45,0	45,0	65,0
	Regular	5	25,0	25,0	90,0
	Needs improvement	2	10,0	10,0	100,0
	Total	20	100,0	100,0	

Elaboración propia

En la prueba de press de banca, los resultados muestran un buen nivel de ejecución en las 20 deportistas evaluadas. Según la tabla de frecuencia, el 20% de las participantes logró obtener un nivel "Excelente", lo que quiere decir que estas deportistas tienen buena fuerza en este

ejercicio. Un 45% adicional fue catalogado como "Bueno", lo que indica que la mayoría de las participantes se encuentra en un nivel aceptable, pero no excelente. Pero un 25% de las deportistas se situó en la categoría "Regular", por lo que todavía tienen margen para mejorar su fuerza en el press de banca. Finalmente, un 10% de las deportistas se ubica en la categoría "Por mejorar",



evidenciando que requieren ser entrenadas con mayor atención.

Este análisis sugiere que, aunque un número significativo de mujeres está logrando resultados positivos, existe un grupo considerable que podría beneficiarse de un enfoque más centrado en el desarrollo de la fuerza. Es esencial considerar factores como el entrenamiento previo y el estado físico general de las deportistas, ya que estos pueden influir en sus resultados. Los hallazgos destacan tanto las fortalezas como las áreas de oportunidad dentro del grupo, lo que puede guiar futuras

intervenciones y programas de entrenamiento adaptados a las necesidades específicas de cada deportista (Molik, y otros, 2015).

**Tabla 4**

<b>SQUAT (WOMEN)</b>	
Excellent	+75 kg
Good	55 – 74 kg
Regular	35 – 54 kg
Needs improvement	< 35 kg

Elaboración propia

**Table 5 results of the squat test**

		Frequency		Percentage	Valid	Cumulative
		Percentage	Valid	Percentage	Percentage	Percentage
Valid	Excellent	1	5,0	5,0	5,0	5,0
	Good	2	10,0	10,0	10,0	15,0
	Regular	2	10,0	10,0	10,0	25,0
	Needs improvement	15	75,0	75,0	75,0	100,0
	Excellent	20	100,0	100,0	100,0	

Elaboración propia

In the squat test, the results show a worrying decline in the performance of the 20 athletes evaluated. According to the frequency table, only 5% of the participants were in the "Excellent" category, demonstrating that very few have managed to develop optimal strength and technique in this exercise. Furthermore, 10% were in

the "Good" category, indicating that there are athletes with acceptable performance, but far from ideal.

An additional 10% were categorized as "Fair," showing that a considerable percentage of athletes have difficulty performing the squat.



But the most concerning finding is that 75% of the participants are in the "Needs Improvement" category, demonstrating that they still need to develop their muscular strength and technique. This is an alarming situation, as it means that the majority of the athletes need more specific attention and training to improve in this exercise.

These findings highlight the importance of developing training programs aimed at improving the athletes' strength and technique deficiencies. It is also important to create a supportive and motivating environment for these women to engage in their physical development process. In conclusion, the squat test results reveal a vulnerable area in the participants' physical development, so actions should be implemented to improve performance in this test. The results, according to

Gamozales et al., indicate that incorporating Paralympic sports into physical education classes allows teachers to promote values such as cooperation and develop positive attitudes toward people with disabilities (Gamonzales, Hernández-Beltrán, Gámez-Calvo, & Muñoz-Jiménez, 2023).

**Tabla 6**

<b>Own elaboration</b>	
<b>MILITAR PRESS (WOMEN)</b>	
Excelente	+30 kg
Bueno	20 – 29 kg
Regular	15 – 19 kg
Por mejorar	< 15 kg

**Tabla 7 Resultados de la prueba de Press Militar**

		Frequency	Percentage	Percentage Valid	Cumulative Percentage	
Own elaboration	Valid Excelente	10	50,0	50,0	50,0	The data from the Military Press test shows good
	Bueno	8	40,0	40,0	90,0	
	Regular	2	10,0	10,0	100,0	
	Total	20	100,0	100,0		



performance among the 20 athletes evaluated. According to the frequency table, 50% of the participants were in the "Excellent" category, indicating that half of the participants have developed adequate strength in this exercise. This result is positive, as it demonstrates good upper body physical capacity, which is fundamental for strength development.

Furthermore, 40% of the athletes were in the "Good" category, meaning that most are performing at an adequate level, but still have room for improvement. However, 10% were categorized as "Fair," indicating that a small percentage have difficulties with the Military Press.

Overall, these findings indicate that Goalball training and practice positively influenced the players' upper body strength. However, it is important to establish training programs specifically for those in the "Fair" category so that all participants can develop their physical abilities holistically. In conclusion, the results of the Military Press test present a favorable outlook, highlighting both achievements and areas for improvement in the athletes' physical capacity. Goalball players, regardless of their competitive levels, demonstrate that personal characteristics can influence performance and reaction time, and that exercises to improve aerobic

and anaerobic metabolism are necessary to strengthen limb strength and power (Fernández Muñoz, Campos, Campos, Rocha, & Castelli, 2021).

### **Discussion**

The data from the Bench Press test on blind female Goalball players indicates that 20% reached an "Excellent" level and 45% reached a "Good" level, demonstrating good upper body strength. However, the remaining 35% are at the "Fair" and "Needs Improvement" levels, indicating they still need to work on improving.

These findings align with Jiménez (2020), who suggests that training in Paralympic sports can improve the strength and physical performance of Paralympic athletes, and that appropriate interventions can improve the performance of Paralympic athletes who are not performing at their peak. Furthermore, structured training programs focused on Goalball could transform the development of these players.

In the Squat test, the data is concerning, as 75% of the players are at the "Needs Improvement" level, making it necessary to work on specific programs to strengthen the lower body, which is crucial for Goalball performance and daily life. The low representation of women in the "Excellent" and "Good" categories reveals that current training is not meeting their strength and



technique needs. Recent studies (Ocampo and Ramírez, 2018) show that structured strength training improves physical capabilities in blind women, and the lack of such a program limits their potential.

In the Military Press test, the results are favorable: 50% of the athletes scored at an "Excellent" level and 40% at "Good," demonstrating good upper body strength. However, 10% scored at "Fair," showing that a small percentage find this exercise difficult.

These findings align with Cadilla et al. (2025), who report that appropriate strength training guidance can improve physical capabilities in women with disabilities, with targeted interventions being crucial for performance enhancement.

### **Conclusion**

Strength tests in blind Goalball players showed improvement in some areas, such as the Bench Press and Military Press, where most reached "Excellent" and "Good" levels. However, the high number of participants rated "Needs Improvement" in squats highlights the need for training programs to enhance lower body strength, which is crucial for performance in this test as well as for everyday functionality. These findings support the need for a personalized training approach that improves physical

performance and promotes the inclusion and empowerment of female athletes in the sport, enabling each athlete to reach their full potential.

Strength training is essential for developing physical capabilities and integrating blind women into Goalball. By strengthening their muscles, athletes improve their athletic performance, feel more confident, and feel better about themselves, allowing them to participate in physical and social activities. This methodology not only promotes equality in sports but also creates an inclusive environment where women with visual impairments can overcome barriers and enjoy exercise and camaraderie. In conclusion, strength training not only improves athletic performance but also allows them to participate in and contribute to society.

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