ATATÜRK ÜNİVERSİTESİ YAYINLARI
ATATURK UNIVERSITY PUBLICATIONS

Research Article *Araştırma Makalesi* DOI: 10.62425/rses.1495571

The Effect of Combined Blood Flow Restriction TheraBand Training on Functional Capacity and Quality of Life

Kombine Uygulanan Kan Akışı Kısıtlama Terabant Antrenmanının Fonksiyonel Kapasite ve Yaşam Kalitesine Etkisi

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ABSTRACT

This study aims to examine the effects of 4-week combined blood flow restriction-TheraBand training on functional capacity and quality of life in healthy individuals aged 55-65 years. A total of 24 women aged 55-65 participated in the study voluntarily. Participants were divided into three groups consisting of 8 people: TheraBand group (TG), blood flow restriction+TheraBand group (BFR+TG), and control group (CG). Participants were administered a 30-second sit-to-stand chair test, a 6-minute walk test (6MWT), and Modified Borg Scale (MBS) for quality of life. In intra-group comparisons, both the Borg scale and 6MWT showed statistically significant improvements favouring the final test in TG and BFR+TG groups (p= .05). Inter-group comparisons revealed that the BFR+TG group exhibited higher improvement compared to the other groups. Significant differences favouring the final test were also observed in the intra-group comparison of the 30-second sit-to-stand test in TG and BFR+TG groups (p= .05), with the BFR+TG group showing higher improvement compared to the CG in inter-group comparisons. Moreover, no statistically significant differences were found in intra-group and inter-group comparisons of quality of life (p= .05). In conclusion, it can be recommended that lower-intensity strength training with TheraBands, combined with BFR where possible, be applied to elderly individuals instead of high-intensity strength training and, if possible, use the BFR method in these training.

Keywords: Blood flow restriction, quality of life, functional capacity

ÖZ

Yapılan çalışmanın amacı sağlıklı bireylere 4 haftalık kombine olarak uygulanan kan akışı kısıtlama-terabant antrenmanlarının yaşam kalitesi ve fonksiyonel kapasite üzerine olan etkisinin incelenmesidir. Çalışmaya 55-65 yaş arası toplam 24 kadın gönüllü olarak katılmıştır. Katılımcılar 8 kişiden oluşan terabant grubu (TG), kan akışı kısıtlama+terabant grubu (KAK+TG) ve kontrol grubu (KG) olarak üç gruba ayrılmıştır. Katılımcılara 30 sn sandalyeye otur kalk testi, 6 dakika yürüme testi (6DYT) ve modifiye borg skalası (MBS) ölçümü ile yaşam kalite ölçeği uygulanmıştır. Çalışma sonucunda hem MBS hem de 6DYT yürüme testlerinin grup içi karşılaştırılmasında TG ve KAK+TG gruplarında son test lehine istatistiksel olarak anlamlı bir fark bulunurken (p= ,05), bu parametrelerin gruplar arası karşılaştırılmasında ise KAK+TG grubunun diğer gruplara göre daha yüksek bir gelişim sağladığı belirlenmiştir. 30 sn otur-kalk testinin grup içi karşılaştırılmasında TG ve KAK+TG grubunda son test lehine anlamlı fark bulunurken (p= ,05), bu parametrelerin gruplar arası karşılaştırılmasında KAK+TG grubunun KG'ye göre daha yüksek bir gelişim sağladığı tespit edilmiştir. Ayrıca yaşam kalitesinin grup içi ve gruplar arası karşılaştırılmasında istatiksel olarak anlamlı fark belirlenmemiştir (p= ,05). Sonuç olarak, yaşlı bireylere yüksek şiddetli kuvvet antrenmanları yerine terabantlar ile daha düşük şiddetli kuvvet antrenmanlarının uygulanması ve imkân varsa bu antrenmanlarda KAK yönteminin kullanılması önerilebilir.

Anahtar Kelimeler: Kan akışı kısıtlama, yaşam kalitesi, fonksiyonel kapasite

Geliş Tarihi/Received	04.06.2024
Kabul Tarihi/Accepted	05.11.2024
Yayın Tarihi/Publication Date	25.12.2024

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Cite this article: Aktuğ, Z.B., Selçuk, Ç., Yavuz, G., & Pişkin, N.E. (2024). The effect of combined blood flow restriction theraband training on functional capacity and quality of life. *Research in Sport Education and Sciences, 26*(4), 150-158.

Introduction

After the age of 30, muscle mass decreases by 3-8% every decade (English & Paddon-Jones, 2010), leading to an increased risk of muscle atrophy, physical decline, and sarcopenia in older individuals (Centner et al., 2019). Consequently, this condition not only limits an individual's active lifestyle (Aghamolaei et al., 2011) but also results in difficulty performing simple daily movements such as dressing or reaching for a box on the top shelf, along with an increased risk of falls. These challenges escalate with advancing age, consequently reducing the quality of life (Brach & VanSwearingen, 2002). To mitigate these adverse outcomes, prevent chronic diseases, and improve the quality of life, strength training plays a crucial role (Paproski et al., 2019). Strength training aims to prevent muscle atrophy while effectively enhancing muscle strength and power (Garber et al., 2011).

Research indicate that traditional strength training has been said to involve training at intensities greater than 70% of your one repetition maximum (1RM) to promote gains in muscular strength (American College of Sports Medicine Position Stand, 2009). However, the elderly and rehabilitated patients may face challenges with high-intensity strength training due to the high mechanical stress placed on the joints, which can potentially lead to injuries that compromise overall health (Loenneke & Pujol, 2009). Considering the difficulty elderly individuals may have in performing high-intensity strength training, there is a need for alternative methods. One of the most significant alternatives is blood flow restriction (BFR) training, which can be applied at lower intensities (Centner et al., 2019).

In the BFR method, the overall training intensity is kept low to target the improvement of older adults' musculoskeletal systems (Loenneke & Pujol, 2009). BFR involves the use of a specialized pressure cuff wrapped around the proximal portion of the limb, which restricts blood flow while not completely occluding arterial circulation. This reduction in blood flow aims to decrease oxygen delivery to the muscles and induce venous pooling, thereby promoting muscle development (Loenneke & Pujol, 2009; Fitschen et al., 2014; Loenneke et al., 2011; Patterson et al., 2019). The specific mechanisms underlying the development induced by BFR training are still under investigation. It is noted that various interconnected concepts such as muscle protein synthesis and breakdown mechanisms, satellite cell regulation, energy systems, increased motor unit recruitment, hormonal effects, increase in cellular fluid, metabolic stress, mtTOR signalling pathway, and heat shock proteins play roles in the development observed with BFR training (de Castro et al., 2017). The BFR method can be combined with different training modalities (weight machines, TheraBands, vibration devices, EMS, cycling, gymnastics, yoga, walking, running, plyometric and nordic hamstring exercises) (de Queiros et al., 2021; Yasuda et al, 2017; Loenneke et al., 2012; Pişkin et al., 2022; Razeke et al., 2020; Pişkin et al., 2024). Although there are studies on BFR+TheraBand training combinations in the literature, research evaluating both quality of life and functional capacity simultaneously in the elderly population is limited.

Thus, the hypothesis of the present study is formulated as "combining TheraBand training with BFR method enhances both quality of life and functional capacity to a greater extent".

Methods

Participants

The sample of the study consisted of a total of 24 female volunteers aged between 55 and 65 years without any health problems (Table 1). While the participants were included in the study, the necessary health reports were obtained, and it was confirmed that no motor dysfunction would prevent them from performing the exercises. For the study, an ethics committee approval report dated 29/08/2023 and decision number 2023/45 was received from Niğde Ömer Halisdemir University Non-Interventional Clinical Research Ethics Committee. This study was conducted in accordance with the Principles of the Declaration of Helsinki. Verbal consent was obtained from all the participants.

Research Design

Before commencing the training protocols, participants underwent the following assessments in sequence: the 30-second sit-to-stand test, the 6-minute walk test (6MWT), and the quality-of-life scale. Additionally, the Borg scale was used to assess fatigue and pain levels immediately after the 6MWT. Prior to the training period, participants were divided into three groups: the TheraBand group (TG) (n=8) performing only TheraBand exercises, the BFR+ TheraBand group (BFR+TG) (n=8) performing TheraBand exercises combined with blood flow restriction (BFR), and the control group (CG) (n=8) not engaging in any exercises.

Subsequently, participants followed their respective training programs for four weeks, after which the final assessments were conducted. It has been stated that the increase in strength that occurs in the first weeks (4 weeks) of strength training is due to neural adaptation (Baechle and Earle, 2008; Günay et al., 2017). Therefore, although muscle hypertrophy is not expected before 4 weeks, it has been stated that muscle hypertrophy occurs in less than 4 weeks in strength training performed with the BFR method. This situation shows that the muscle hypertrophy mechanism that occurs after early strength gain due to neural adaptation is reversed after training with the BFR method (Loenneke et al., 2012).

Applied Tests

30-Second Sit-to-Stand Test

The 30-second sit-to-stand test was administered twice in total: at the beginning of the study and at the end of the fourth week. This test evaluates individuals' sit-to-stand activity, lower extremity strength and dynamic balance. For the test, a chair with a seat height of approximately 44 cm and a backrest was used, along with a stopwatch. The chair was secured to prevent movement during the sit-to-stand activity, and care was taken to ensure that the participant's feet were in contact with the floor when seated. The test involved the participant sitting comfortably on the chair with full contact for 30 seconds, then transitioning to a standing position, and finally returning to a seated position on the chair. The stopwatch was started at the moment of the first rise, and the number of sit-to-stand repetitions performed by the individual within 30 seconds was recorded (Jones et al., 1999).

6-Minute Walk Test (6MWT)

The 6-minute walk test (6MWT) was conducted twice in total: at the beginning of the study and at the end of the fourth week. The 6-MWT, which reflects functional capacity, required participants to walk as fast as possible for 6 minutes without running or jumping over 30 meters. Participants were instructed not to speak during the test, and the test began with the participant's initiation of walking. Additionally, time-related information was provided to the participants every 60 seconds. Participants were informed that they could stop the test if they experienced any health problems. At the end of the allotted time, the total distance covered by the participants was recorded in meters (American Thoracic Society, [ATS] 2002).

Modified Borg Scale

Immediately after the 6-MWT, the Modified Borg Scale (MBS) was used to assess the severity of pain and fatigue. Participants rated their level of fatigue and pain experienced during the test on a scale ranging from nothing (6) to exhaustion (20), with descriptors including very, very light (7-8), very light (9-10), quite light (11-12), somewhat hard (13-14), hard (15-16), very hard (17-18), and extremely hard (19) (Borg, 1982).

Quality of Life Scale (SF-36 Short Form)

The SF-36 Short Form Quality of Life Scale was administered twice in total, at the beginning and at the end of the fourth week of the study. The scale consists of eight subscales assessing physical functioning, physical role limitations, emotional role limitations, energy/fatigue/vitality, mental health, social functioning, pain, and general health perception. Each subscale is scored separately, ranging from 0 to 100, with higher scores indicating better health status. There is no total score for the scale (Ware et al., 1993).

Training Protocol

TG Training Protocol

The difficulty level of therabands is classified into different levels according to the resistance they create as they are extended. These are indicated by colors representing eight different difficulty levels. The colors are listed from easy to more difficult, including skin color, yellow, red, green, blue, black, gray and golden yellow (Baltacı et al., 2003; Thera-Band, 2006). Since the study sample consisted of sedentary individuals, the applied squat banded, leg extension, and band curl in prone movements were performed with a light tension intensity using yellow-coloured TheraBand. The training sessions were conducted 3 days a week, with 3 sets, and a repetition scheme of 30-15-15, with rest intervals of 30-45 seconds between sets. A rest period of 2 minutes was applied during transitions to new exercises.

BFR+TG Training Protocol

To restrict blood flow, elastic bands with a width of 76 mm were used in the lower extremities as an alternative to pneumatic cuffs for the participants. The elastic band was applied proximally to both legs during the training session, removed between sets and exercises, and re-applied during movements. When adjusting the pressure on the lower extremities, assistance was sought from the numbers on the band, and the pressure was evaluated based on a numerical value ranging from 1 to 10. A value of 10 represented maximum pressure, while 0 represented no pressure sensation at all. Studies have been conducted in the literature to ensure the safer and more reliable use of these bands and recommended pressure adjustment up to zones 7-8 (Lowery et al., 2014; Wilson et al., 2013). Therefore, in our study, pressure sensation was adjusted to be between 7-8, and squat banded, leg extension, and band curl in prone training movements were performed using yellow-coloured TheraBand. The training sessions were conducted as 3 days a week, with 3 sets, and a repetition scheme of 30-15-15, with rest intervals of 30-45 seconds between sets. A rest period of 2 minutes was applied during transitions to new exercises.

Statistical Analysis

In this study, the assumption of normal distribution for quantitative variables was examined visually (histograms and probability plots) and analytical methods (Shapiro-Wilk Test). Since the quantitative variables exhibited normal distribution, they were expressed as mean and standard deviation. To examine the results of different protocols (BFR+TG, TG, CG), pre-test and post-test measurements, and the protocol*time interaction effect, a Repeated Measures two-way ANOVA test was utilized. Mauchly’s sphericity test was employed to test the homogeneity of variances, and Greenhouse-Geisser correction was applied when necessary. Partial eta squared (ηp2) values were calculated to determine the effect size between groups, and a significance level of p=0.05 was considered in the study.

Results

Table 1.
Demographic variables of the participants

	Theraband+BFR	Theraband	Control Group	
	M±SD	M±SD	M±SD	*p*
Age (years)	59.50±6.52	61.62±6.82	61.22±7.10	.13
Height (cm)	161.75±9.48	153.75±6.84	158.33±4.41	.10
Body weight (kg)	79.62±9.57	75.37±12.44	79.55±7.95	.62
BMI (kg/m^2)	30.50±3.33	31.71±3.20	31.73±2.80	.66

Tablo 1 shows demographic variables of the participants. No difference was determined between the groups in age, height, body weight and BMI parameters.

Table 2.
Comparison of intra-group and inter-group functional capacity and Borg scale parameters

n=24	Pre	Post	%	Two-way Repeated ANOVA			
Variable	M±SD	M±SD	T_B-T_{end}	Time	Group	Time*Group	Tukey
30-Second Sit-to-Stand Test							
Theraband	10.50±2.97	12.00±2.72*	14.28	F = 27.75	F = 1.80	F = 11.55	
Theraband+BFR	9.87±2.41	12.50±1.30*	26.64	$p < .001$	$p < .188$	$p < .001$	BFR+TG >CG
Control	9.44±2.35	9.22±2.63	-2.33	$\eta_p^2 = 0.55$	$\eta_p^2 = 0.14$	$\eta_p^2 = 0.51$	
6-Minute Walk Test (m)							
Theraband	249.00±63.4	279.00±55.82*	12.04	F = 34.81	F =8.72	F =8.98	
Theraband+BFR	307.50±60.8	358.50±45.09*	16.58	$p < .001$	$p < .002$	$p < .001$	BFR+TG >TG/CG
Control	226.66±46.2	229.33±48.90	1.17	$\eta_p^2 = 0.61$	$\eta_p^2 = 0.44$	$\eta_p^2 = 0.45$	
Modified Borg Scale							
Theraband	13.50±1.69	12.75±1.48*	5.55	F = 23.67	F = 8.11	F = 7.63	
Theraband+BFR	11.25±2.16	9.25±2.71*	17.77	$p < .001$	$p < .002$	$p < .003$	BFR+TG >TG/CG
Control	13.55±1.33	13.44±1.66	0.81	$\eta_p^2 = 0.51$	$\eta_p^2 = 0.42$	$\eta_p^2 = 0.41$	

Pre= Preintervention; Post= Postintervention; ηp2: Partial eta squared; Bold values denote statistical significance at the p = 0.05 level.
* There is a significant difference between the pre-test and post-test.

Tablo 2 shows comparison of intra-group and inter-group functional capacity and Borg scale parameters. In the 30-second sit-to-stand test, statistically significant differences were found from pre-test to post-test in BFR+TG and TG (F=27.75; *p*=.000, ηp^2=0.55). In inter-group comparison, it was determined that BFR+TG showed higher improvement compared to CG (F=1.80; *p*=.1888; ηp^2=0.14). Considering the improvement levels in percentage (%), the highest improvement was observed in BFR+TG. In the 6-minute walk test (F=34.81; *p*=.000, ηp^2=0.61) and modified Borg scale parameter (F=23.67; *p*=.000, ηp^2=0.51), statistically significant differences were found from pre-test to post-test in BFR+TG and TG. In inter-group comparison, it was determined that BFR+TG showed higher improvement compared to TG and CG in the 6-minute walk test (F=8.72; *p*=.002, ηp^2=0.44) and modified Borg scale parameter (F=8.11; *p*=.002, ηp^2=0.42). Looking at the improvement levels in percentage (%), the highest improvement was observed in BFR+TG.

Table 3.
Comparison of intra-group and inter-group assessment of quality-of-life scale

n=24	Pre	Post	%	Two-way Repeated ANOVA		
Variable	M±SD	M±SD	T_B-T_{end}	Time	Group	Time*Group
Physical function						
Theraband	71.25±9.16	71.87±14.12	0.87	F = 0.18	F = 0.12	F = 0.00
Theraband+BFR	73.75±12.74	74.37±11.78	-0.84	*p* < .001	*p* < .888	*p* < 1.000
Control	71.87±9.61	72.50±8.86	0.87	η_p^2 = 0.00	η_p^2 = 0.11	η_p^2 = 0.00
Physical role difficulty						
Theraband	25.00±26.72	21.87±28.14	-12.52	F = 0.03	F= 1.42	F = 0.59
Theraband+BFR	40.62±46.17	37.50±44.32	-7.68	*p* < .849	*p* < .264	*p* < .562
Control	9.37±18.60	18.75±22.16	100.10	η_p^2 = 0.02	η_p^2 = 0.11	η_p^2 = 0.05
Emotional role difficulty						
Theraband	45.83±39.59	25.00±34.50	-48.80	F = 1.11	F = 0.34	F = 1.24
Theraband+BFR	20.83±35.35	25.00±23.57	20.01	*p* < .303	*p* < .714	*p* < .307
Control	33.33±30.86	29.16±41.54	-11.63	η_p^2 = 0.05	η_p^2 = 0.03	η_p^2 = 0.10
Energy / dynamics / vitality						
Theraband	22.50±24.64	24.37±13.47	8.31	F = 0.01	F = 1.74	F = 0.43
Theraband+BFR	39.37±16.13	35.00±17.32	-11.09	*p* < .912	*p* < .200	*p* < .654
Control	33.12±19.07	36.87±17.10	11.32	η_p^2 = 0.01	η_p^2 = 0.14	η_p^2 = 0.04
Mental health						
Theraband	44.50±21.32	40.00±17.10	-10.11	F = 0.09	F = 1.86	F = 0.80
Theraband+BFR	57.00±26.42	62.50±17.09	9.64	*p* < .763	*p* < .180	*p* < .461
Control	53.50±16.82	55.50±21.10	3.73	η_p^2 = 0.00	η_p^2 = 0.15	η_p^2 = 0.07
Social functioning						
Theraband	64.06±25.38	53.12±24.77	-17.07	F = 0.03	F = 0.47	F = 1.31
Theraband+BFR	62.50±14.94	68.75±11.57	10,00	*p* < .844	*p* < .629	*p* < .291
Control	63.12±29.02	70.93±24.60	12,37	η_p^2 = 0.00	η_p^2 = 0.04	η_p^2 = 0.11
Pain						
Theraband	43.12±19.16	42.18±21.85	-2,17	F = 0.38	F = 1.90	F = 2.00
Theraband+BFR	46.87±9.97	57.18±18.39	21,99	*p* < .543	*p* < .174	*p* < .159
Control	37.56±19.41	33.81±19.21	-9,98	η_p^2 = 0.18	η_p^2 = 0.15	η_p^2 = 0.16
General health perception						
Theraband	48.75±22.79	50.62±22.10	3.83	F = 2.14	F = 0.72	F = 0.28
Theraband+BFR	56.25±17.06	61.87±16.02	9.99	*p* < .158	*p* < .495	*p* < .753
Control	53.75±23.10	62.50±12.81	16.27	η_p^2 = 0.09	η_p^2 = 0.06	η_p^2 = 0.02

Pre= Preintervention; Post= Postintervention; ηp2: Partial eta squared; Bold values denote statistical significance at the p = 0.05 level.
* There is a significant difference between the pre-test and post-test.

Tablo 3 shows comparison of intra-group and inter-group assessment of quality-of-life scale. There were no statisticilay significant differences in both pre-post test and group*time interaction for physical function (F=0.18; *p*=.000, ηp^2=0.00), physical role difficulty (F=0.03; p=0.849, ηp^2=0.02), emotional role difficulty (F=1.11; *p*=.303, ηp^2=0.05), energy / dynamics / vitality (F=0.01; *p*=.912, ηp^2=0.01), mental health (F=0.09; *p*=.763, ηp^2=0.00), social functioning (F=0.03; *p*=.844, ηp^2=0.00), pain (F=0.38; *p*=.18, ηp^2=0.55) and general health perception (F=2.14; *p*=.158, ηp^2=0.09). Additionally, no significant difference was determined in inter-group comparison.

Discussion

Strength training that can be done at home with TheraBands is widely used for the elderly and individuals with low activity levels (Rogers et al., 2002; Zion et al., 2003; Colado & Triplett, 2008; Colado et al., 2010). Studies in the literature have shown positive effects of TheraBand training combined with the BFR method on muscle strength in elderly and clinical populations (Yasuda et al., 2014; Kjeldsen et al., 2019). However, while previous studies in the literature have focused solely on strength development using the BFR method, there are limited studies that simultaneously assess strength development, functional capacity, and quality of life. The aim of this study, conducted to fill this gap in the literature, is to investigate the effects of TheraBand training combined with the BFR method on quality of life and functional capacity in elderly individuals.

Functional Capacity

Upon examining Table 2, after four weeks of training, improvement was observed in both TG and BFR+TG groups in the 6-minute walk test (6MWT), modified borg scale (MBS), and 30-second sit-to-stand test. This improvement was higher in the BFR+TG and TG groups compared to the CG group in the 30-second sit-to-stand test, while in the 6MWT and MBS tests, it was higher in the BFR+TG group compared to both TG and CG groups. Clarkson et al. (2017) conducted a study on elderly adults to examine the effects of low-intensity walks combined with the BFR method on the scores of the 30-second sit-to-stand test, 6MWT, time up to go test, and Queen's College step test. The results of this study indicated that for populations unable to perform high-intensity exercises, low-intensity walks combined with the BFR method would be effective in improving functional capacity. Other studies conducted on the elderly have also found that strength training using the BFR method is effective in increasing muscle strength and functional capacity (Karabulut et al., 2010; Vechin et al., 2015). Shimizu et al. (2016) divided participants into two groups: those performing strength training with the BFR method and those performing strength training without the BFR method, in a study conducted on a healthy elderly population. Both groups were subjected to two movements involving the lower and upper extremities, and it was determined that strength development was higher in the BFR group.

The sample groups and study designs of the studies mentioned above are similar to our study, and positive effects were observed on strength (30-second sit-to-stand test) and aerobic capacity (6-minute walk test) parameters. In our study, intra-group differences were observed in the 30-second sit-to-stand test associated with lower extremity strength in both BFR+TG and TG groups, while inter-group differences were only observed with the KG group. However, when the percentage increase rate between BFR+TG and TG was examined, it was determined that the effect level was higher in BFR+TG (BFR+TG 26.64% increase - TG 14.28% increase). Another parameter in which BFR+TG showed significant improvement compared to both TG and CG, and had the lowest score, is the MBS. The difference in favour of BFR+TG in the MBS parameter is thought to be associated with the perceived level of effort reduction due to the higher level of strength development observed in this group.

Another parameter in which BFR+TG shows a significant increase compared to TG and CG is the 6MWT. 6MWT is widely used as a measure of functional capacity, more commonly associated with aerobic capacity (Enright et al, 2003; ATS, 2002). The combination of the BFR method with low-intensity resistance training has been frequently proven in the literature to have a positive effect on strength development (Vanwye et al., 2017). However, research on aerobic capacity is still ongoing, and conflicting results are being presented in both young and elderly populations (Castilla-López et al., 2022). It has been assumed that the BFR method primarily stimulates peripheral adaptations in the elderly population. Since deteriorations in the peripheral system with increasing age are not typically observed in young individuals, it is suggested that training performed with the BFR method is more likely to provide central cardiovascular adaptations in the elderly population (Bennett & Slattery, 2019). When the 6MWT results in our study are examined, it is thought that the significant increase in BFR+TG compared to both TG and CG may be related to this situation.

Quality of Life

The acquisition and maintenance of moderate muscle strength (such as lifting weights, climbing stairs, and getting up from a chair) help minimize the negative effects of aging, enabling individuals to perform daily activities and contributing to an increase in quality of life (Vale et al., 2006). As the aging process tends to decrease muscle strength in the elderly, strength training with or without BFR aims to maintain the quality of life, reduce the risk of falls, and improve the essential strength needed to perform daily activities in this population (Carvalho & Soares, 2004). In a study by Ruaro et al. (2019), it was stated that a 14-week strength program combined with the BFR method and a strength program without the BFR method significantly improved the quality of life in the elderly population. In another study, the direct impact of the BFR method on variables such as pain, functionality, and quality of life was analysed. As a result of the study, it was concluded that this method reduced pain and improved daily life activities (Centner & Lauber, 2020). In a systematic review conducted by Reina-Ruiz et al. (2023), it was determined that 12 weeks of aerobic exercise with and without BFR improved the quality of life. They stated that the improvement was similar in both groups. Additionally, the lack of difference in quality of life between the groups was attributed to the pressure applied in the BFR group being below the average (Reina-Ruiz et al., 2023; Castilla-López, 2022). A common characteristic of the studies mentioned above is that they all had long-term training programs. Literature includes studies where statistically significant differences in the quality of life have been observed in training sessions with BFR. The most important common feature of these studies is the determination of individualized pressure ranges and the use of pneumatic cuff types, along with the training duration being longer than 4 weeks (Reina-Ruiz et al., 2023; Hughes et al., 2019; Tennent et al., 2017). Therefore, the lack of difference in quality of life between the TheraBand training groups with and without BFR method may be attributed to the limited duration of the training program being only 4 weeks. It is thought that the increase in strength and aerobic capacity over the 4-week period may have been insufficient to provide adequate stimulus for parameters related to quality of life. Therefore, extending the duration of the training may further enhance the development of strength in participants, which could result in improvements in quality of life.

Conclusion and Recommendations

When considering the elderly and individuals with low activity levels, the fact that BFR+TheraBand exercises provide a short-term development in strength provides an advantage for this population. However, a longer-term training program is needed to provide sufficient stimulation in quality of life parameters. In conclusion, it can be recommended that lower-intensity strength training with TheraBands, combined with BFR where possible, be applied to elderly individuals instead of high-intensity strength training and, if possible, use the BFR method in these training.

Literature reveals studies that show both similarities and differences in the effectiveness of the BFR method compared to our study findings. One reason for the variability among studies is the absence of a standardized methodology in all studies involving the BFR method (such as cuff type, cuff width, pressure range, determination of limb occlusion pressure, training intensity, training duration, etc.). Therefore, there is a need for further studies with BFR method particularly in the elderly population.

Etik Komite Onayı: Bu çalışma için etik komite onayı Niğde Ömer Halisdemir Üniversitesi'nden (Tarih: 29 Ağustos 2023, Karar No: 2023/45) ile alınmıştır..
Katılımcı Onamı: Çalışmaya katılan tüm katılımcılardan sözlü onam alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Yazar Katkıları: Fikir; Z.B.A; Tasarım; Z.B.A., G.Y; Denetleme; N.E.P., G.Y.; Kaynaklar; Ç.S., G.Y.; Veri Toplanması ve/veya İşlemesi; Ç.S., N.E.P.,; Analiz ve/ veya Yorum; Z.B.A.; Literatür Taraması; N.E.P., G.Y.; Yazıyı Yazan; Z.B.A., G.Y., N.E.P.,; Eleştirel İnceleme; Z.B.A.
Çıkar Çatışması: Yazarlar, çıkar çatışması olmadığını beyan etmiştir.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Niğde Ömer Halisdemir University (Date: 29 August, 2023, Decision Number: 2023/45
Informed Consent: Verbal consent was obtained from all the participants.
Peer-review: Externally peer-reviewed.
Author Contributions: Concept-Z.B.A.; Design-Z.B.A., G.Y.; Supervision-N.E.P., G.Y.; Resources-Ç.S., G.Y.; Data Collection and/or Processing-Ç.S., N.E.P.; Analysis and/or Interpretation-Z.B.A.; Literature Search-N.E.P., G.Y.; Writing Manuscript-Z.B.A., G.Y., N.E.P.; Critical Review-Z.B.A.
Conflict of Interest: The authors have no conflicts of interest to declare.
Financial Disclosure: The authors declared that this study has received no financial support.

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