RESEARCH PAPER

Adjunctive Kinesio Taping in Post-Liposuction Rehabilitation of Lipedema: Effects on Edema Reduction and Body Appreciation: A Randomized Controlled Trial

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ABSTRACT

Background: Lipedema is a chronic, progressive adipose tissue disorder characterized by disproportionate subcutaneous fat deposition and secondary fluid accumulation, predominantly affecting the lower limbs. Although liposuction is effective in reducing pathological fat volume, postoperative edema and functional limitations remain clinical challenges. Adjunctive rehabilitation strategies such as Kinesio taping (KT) have been proposed to enhance lymphatic drainage and improve recovery. Objective: To investigate the effect of Kinesio taping combined with complex decongestive therapy (CDT) on lower limb edema and body appreciation in women with lipedema following liposuction. Methods: A randomized controlled trial was conducted on 62 female patients with upper thigh lipedema (age: 18–40 years; BMI: 29–31 kg/m²) recruited from the outpatient clinic of the Faculty of Physical Therapy, Cairo University. Participants were randomly allocated into two equal groups: a study group receiving KT combined with CDT, and a control group receiving CDT alone. Interventions were initiated 2 weeks post-liposuction and administered 3 sessions per week for 22 weeks. Outcome measures included lower limb edema volume (mathematical volumetric estimation from circumference), thigh circumference (tape measurement), and body image assessed using the Body Appreciation Scale-2 (BAS-2). Assessments were conducted at baseline, 2 weeks post-liposuction (pre-intervention), 2 months, and 6 months. Results: Both groups demonstrated statistically significant improvements in all outcomes over time ($p < 0.001$). The study group showed numerically greater reductions in lower limb edema volume at 2 and 6 months; however, between-group differences were not statistically significant ($p > 0.05$). Similarly, BAS-2 scores improved significantly in both groups with no significant differences between groups ($p > 0.05$). Conclusion: Both Kinesio taping combined with complex decongestive therapy and CDT alone were effective in improving lower limb edema and body appreciation in women with lipedema following liposuction. However, Kinesio taping did not provide additional statistically significant benefit beyond CDT. Further large-scale randomized trials are required to establish standardized postoperative rehabilitation protocols.

Keywords: Lipedema; Kinesio taping; liposuction; complex decongestive therapy; edema; rehabilitation
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INTRODUCTION

Lipedema is a chronic, progressive adipose tissue disorder characterized by disproportionate subcutaneous fat deposition, primarily affecting the lower extremities while sparing the feet. It is associated with pain, tenderness, easy bruising, and edema, leading to functional impairment and reduced quality of life [1]. Despite its estimated prevalence of up to 11% among women, lipedema remains underdiagnosed and frequently misinterpreted as obesity, as the affected adipose tissue is resistant to diet and exercise [2]. The etiology of lipedema is not fully understood; however, hormonal influences and genetic predisposition have been suggested. The condition often manifests during periods of hormonal change such as puberty, pregnancy, or menopause. In addition to physical symptoms, lipedema imposes a significant psychosocial burden, affecting mobility, daily activities, and occupational performance [3,4].

Management strategies include conservative approaches aimed at controlling secondary edema as well as surgical interventions to reduce pathological adipose tissue. Liposuction has emerged as an effective treatment modality, demonstrating improvements in limb volume, pain, and functional outcomes. However, postoperative complications such as edema and tissue fibrosis may impair recovery, necessitating effective rehabilitation strategies [5].

Complex decongestive therapy (CDT), which includes manual lymphatic drainage, compression therapy, exercise, and skin care, is considered the cornerstone of edema management [6]. Recently, Kinesio taping (KT) has gained attention as an adjunctive intervention, with proposed mechanisms including enhancement of lymphatic drainage, reduction of interstitial fluid accumulation, and pain modulation through cutaneous stimulation [7].

Despite its growing clinical use, evidence supporting the effectiveness of Kinesio taping in lipedema patients

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following liposuction remains limited. In particular, there is a lack of high-quality randomized controlled trials evaluating its additive effect when combined with standard CDT. Therefore, the aim of this study was to evaluate the therapeutic efficacy of Kinesio taping combined with complex decongestive therapy on edema and body image in women with lipedema following liposuction.

MATERIALS AND METHODS

Research Design

This study was conducted as an open-label randomized controlled trial designed to evaluate the therapeutic efficacy of Kinesio taping combined with complex decongestive therapy in women with lipedema following liposuction.

Participants

A total of 62 female patients with lower limb lipedema (upper thigh distribution) were recruited for this study. Participants were recruited from the Outpatient Clinic of the Faculty of Physical Therapy, Cairo University and were randomly allocated into two equal groups (31 patients per group). Inclusion criteria included female patients aged 18–40 years, with clinically diagnosed lipedema affecting the upper thigh region and a body mass index (BMI) ranging from 29–31%, and who were scheduled for liposuction. All participants received standard postoperative medical and nursing care and provided written informed consent prior to enrollment. Exclusion criteria included patients with metallic implants at or near the treatment area, implanted electronic devices (e.g., pacemakers), significant systemic conditions such as diabetes mellitus or circulatory disorders, history of skin malignancy in the treatment area, deep venous thrombosis, active smokers, and patients who demonstrated non-compliance with the treatment protocol or follow-up schedule.

Ethics Approval

The study was approved by the Ethics Review Committee of the Faculty of Physical Therapy, Cairo University, Egypt (Approval No. P.T.REC/012/004828). The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrollment.

Sample Size

Sample size estimation was performed using G*Power statistical software (version 3.1.9.2; Franz Faul, Universität Kiel, Germany) based on previous data on lower limb volume changes reported by Szolnoky et al. The calculation indicated that a minimum of 31 participants per group was required to achieve a statistical power of 80%, with an alpha level of 0.05, an effect size of 0.73, and an allocation ratio of 1:1. Accordingly, the final sample size for the study was 62 participants (31 per group).

Randomization

Participants were randomly assigned to one of two groups using a 1:1 allocation ratio based on the predetermined sample size. The randomization sequence was generated by an independent investigator not involved in participant recruitment, assessment, or intervention delivery. Allocation concealment was ensured using sealed, opaque, and sequentially numbered envelopes, which were opened only after baseline assessment to determine group assignment. This procedure was implemented to minimize selection bias and ensure allocation concealment.

Outcome Measurements

Outcome measures were assessed at baseline (pre-liposuction), 2 weeks post-liposuction (pre-intervention), 8 weeks post-intervention, and 16 weeks post-intervention.

Primary Outcome

Tape Measurement: Thigh circumference was measured for all participants in both groups using a non-elastic measuring tape. Patients were instructed to stand in a relaxed position with their arms away from the body, and the measurement area was exposed by removing clothing from the thighs. The anatomical landmark was standardized as 20 cm below the greater trochanter. The measuring tape was placed horizontally around the thigh at the identified level, and the circumference was recorded at the point where the tape overlapped [8]. Lower-limb volume was subsequently estimated from circumferential measurements using the truncated cone (frustoconical) formula, a validated anthropometric method for limb volume estimation in clinical and research settings [9].

Secondary Outcome

Body Appreciation Scale-2 (BAS-2): The Body Appreciation Scale-2 (BAS-2) is a 10-item psychometric instrument developed to assess positive body image. It uses a 5-point Likert scale ranging from 1 (Never) to 5 (Always). Higher scores indicate greater body appreciation. Total scores are calculated by summing all items, yielding a score range from 5 to 50 [10].

Intervention

Participants were randomly allocated into two equal groups (31 patients per group).

Group A (Study Group)

Participants in the study group underwent liposuction followed by combined Kinesio taping and complex decongestive therapy (CDT). Kinesio taping was initiated 2 weeks post-liposuction and applied in addition to CDT.

CDT was administered three sessions per week for 22 weeks and consisted of manual lymphatic drainage (MLD), multilayer short-stretch compression bandaging, therapeutic exercise, and skin care (Földi and Kubik, 2005). MLD was performed using the Vodder technique by a trained physiotherapist for approximately 60 minutes per session, followed by compression bandaging with appropriate foam padding. Participants were instructed to perform lower limb exercises twice daily for 30 minutes and maintain routine skin care [11].

Kinesio taping was applied using the fan technique to facilitate lymphatic drainage. An “I-strip” was cut longitudinally into four tails, leaving a proximal anchor of approximately 1–2 inches. The anchor was applied at the greater trochanter, and the strips were fanned over the medial and posterior thigh with approximately 75% tension. Tape application aimed to promote lymphatic flow, reduce

interstitial fluid accumulation, and decrease postoperative edema [12].

Group B (Control Group)

Participants in the control group underwent liposuction followed by complex decongestive therapy (CDT) only, without Kinesio taping. CDT was administered with the same frequency and standardized protocol as the study group (three sessions per week for 22 weeks) [11].

RESULTS:

Participant Flow

Figure 1 depicts the flowchart of patient progression throughout the study. A total of 68 participants were enrolled. Three participants were excluded prior to randomization: two refused to participate and one did not meet the inclusion criteria. Consequently, 65 participants were randomized into the two study groups.

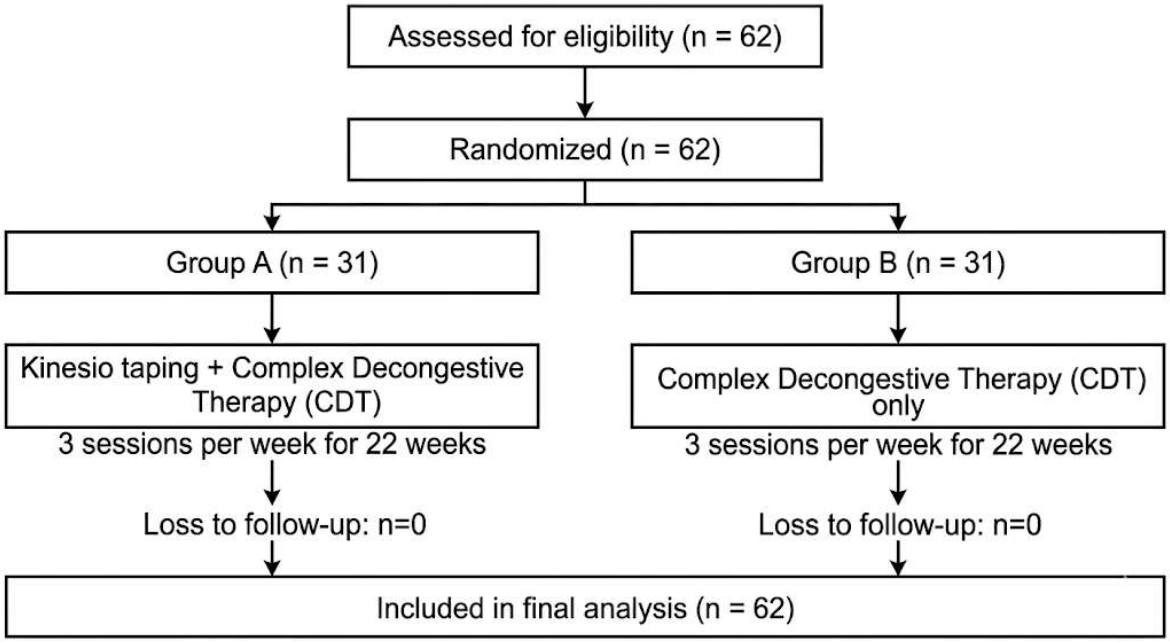

Figure 1. The flowchart of the trial

Baseline characteristics

At baseline, both groups were comparable with no statistically significant differences in demographic or clinical variables (all $p > 0.05$), indicating successful randomization and group homogeneity. Age, body weight, height, BMI, chronicity of lipedema, and disease severity were similar between groups (Table 1).

These findings confirm that both groups started the intervention at equivalent clinical status, minimizing baseline confounding effects.

Table (1): Baseline characteristics of participants in both groups

Characteristics	Group A (n=31)	Group B (n=31)	t-value
Age (years)	27.7±6.15	30.45±5.96	-1.78
Weight (kg)	77.72±6.72	80.36±7.92	1.74
Height (cm)	161.32±7.33	163.87±7.82	-1.32
BMI (kg/m^2)	29.82±0.55	29.86±0.57	-0.25
Chronicity of lipedema (years)	9.61±3.6	10.13±3.1	-0.605
Degree of lipedema	3.16±0.78	2.97±0.79	0.968

Data was expressed as mean ± standard deviation, p- value: significance

Lower-Limb Edema Volume

Within-group analysis:

Both groups demonstrated statistically significant reductions in lower-limb edema volume over time ($p = 0.001$ for all time points).

Between-group analysis:
No statistically significant differences were observed between groups at baseline or any follow-up time points ($p > 0.05$).

Although both interventions were effective, Group A showed a numerically greater reduction in edema volume at 6 months (Table 2).

Table (2): Mean ±standard deviation of LL edema volume pre study, after 2 weeks, 2 months and 6 months of both groups.

Lower limb edema volume (cm^3)	**Group A**	**Group B**	**MD (95% CI)**	**P-value**	**η^2**
Pre study	504342 ± 125876	504344 ± 125875	-2 (-63956, 63952)	0.999	0.001
After 2 weeks	378256 ± 94407	378258 ± 94406	-2 (-47967, 47964)	0.999	0.001
After 2 m.	327822 ± 81819	337910 ± 84336	-10088 (-52303, 32126)	0.634	0.004
After 6 m.	277388 ± 69231	297563 ± 74266	-20174 (-56650, 16302)	0.273	0.020
MD (95% CI)	226954 (200399, 253508)	206781 (180227, 233335)			
P-value	0.001*	0.001*			
Post hoc test for difference between the four measures in each group					
	MD (p-value)	MD (p-value)			
Pre study v. 2 weeks	126089 (0.001)	126086 (0.001)			
% of change	25%	25%			
Pre study v. 2 m.	176520 (0.001)	166433 (0.001)			
% of change	35%	33%			
Pre study v. 6 m.	226954 (0.001)	206781 (0.001)			
% of change	45%	41%			
After 2weeks v. 2 m.	50434 (0.001)	40347 (0.001)			
% of change	13%	11%			
After 2weeks v. 6 m.	100867 (0.001)	80695 (0.001)			
% of change	31%	21%			
After 2 months v. 6 m.	50433 (0.001)	40347 (0.001)			
% of change	15%	12%			

*MD: Mean difference, CI: Confidence interval, p-value: level of significance, *: significant, η2: partial eta square v.: versus, m: month*

Body Appreciation Scale-2 (BAS-2)
Within-group analysis:
Both groups demonstrated a statistically significant improvement in BAS-2 scores after treatment compared with baseline ($p = 0.001$), indicating improved body appreciation and psychological well-being.
Between-group analysis:
No statistically significant differences were observed between groups at baseline or post-intervention ($p > 0.05$).

Table (3): Mean ±standard deviation of BAS-2 score pre and post study of both groups.

Measured variables	**Group A**	**Group B**	**MD (95% CI)**	**P-value[1]**	**η^2**
BAS-2 score					
Pre study	22.1 ± 1.27	22.13 ± 1.36	-0.03 (-0.7, 0.64)	0.924	0.001
Post study	42 ± 1.24	42.16 ± 1.37	-0.16 (-0.82, 0.5)	0.628	0.004
MD (95% CI)	-19.9 (-20.5,-19.3)	-20.03(-20.7, -19.4)			
% of change	90%	90.5%			
P-value	0.001*	0.001*			

*MD: Mean difference, CI: Confidence interval, p-value: level of significance, *: significant, η2: partial eta square*

DISCUSSION
Lipedema is a chronic adipose tissue disorder characterized by disproportionate subcutaneous fat accumulation in the lower extremities, frequently accompanied by secondary interstitial fluid retention, pain, bruising tendency, and functional limitation. Despite increasing recognition, it remains underdiagnosed and often misclassified as obesity or lymphedema, leading to delayed intervention and

progressive disability and psychosocial burden. Hormonal influences and genetic susceptibility have been implicated in disease onset and progression, particularly around puberty, pregnancy, and menopause [13–14].

Surgical intervention, particularly liposuction, has been increasingly recognized as an effective approach for reducing pathological adipose tissue and improving pain, mobility, and quality of life in lipedema patients. Evidence from clinical cohorts demonstrates sustained symptom reduction following tumescent liposuction, including improvements in pain, swelling, and functional limitations [15]. However, postoperative lymphatic imbalance and residual edema remain clinical concerns, requiring structured conservative rehabilitation.

Complex decongestive therapy (CDT), which includes manual lymphatic drainage (MLD), compression therapy, therapeutic exercise, and skin care, is considered the cornerstone of conservative management for lymphatic and adipose-related disorders. CDT has demonstrated significant efficacy in reducing limb volume and improving symptom burden by enhancing lymphatic return, increasing interstitial fluid mobilization, and supporting musculoskeletal pump function [16].

In the present randomized controlled trial, both groups received postoperative CDT following liposuction. The study group additionally received kinesio taping (KT) as an adjunct modality. Importantly, KT was applied in addition to, and not as a replacement for, full CDT including compression therapy. Both groups demonstrated significant reductions in lower-limb volume and improvements in body appreciation over time. However, no statistically significant between-group differences were observed, indicating that the addition of KT did not confer measurable additional benefit beyond CDT alone under the conditions of this protocol.

The absence of superiority of KT can be explained by several physiological and methodological considerations. First, CDT alone may produce a near-maximal decongestive response in the early postoperative phase, creating a ceiling effect that limits the detection of incremental benefit from adjunctive interventions [17]. Second, postoperative edema following liposuction is primarily fluid-dominant and highly responsive to compression and manual lymphatic drainage, which directly target lymphatic and venous return pathways [18]. In contrast, kinesio taping is thought to exert its effects mainly through superficial dermal lifting, increased interstitial space, and cutaneous mechanoreceptor stimulation, which may provide limited additional impact when deep lymphatic drainage is already optimized through CDT [19]. Third, the multidimensional nature of CDT—including compression, exercise, and MLD—targets both superficial and deep lymphatic systems as well as musculoskeletal pumping mechanisms. Therefore, any marginal contribution from KT may be physiologically overshadowed by the dominant effects of compression-based therapy, particularly multilayer short-stretch bandaging, which remains the most powerful external driver of interstitial fluid mobilization [20].

Furthermore, this finding should be interpreted in the context of an additive rather than comparative intervention design. Since both groups received a full CDT protocol, the study specifically evaluated the incremental effect of KT rather than its standalone efficacy. This is a critical methodological consideration when interpreting the absence of between-group differences, as CDT itself represents a high-intensity, multi-component intervention with well-established efficacy.

These findings are partially consistent with previous literature. Several studies have reported that kinesio taping may reduce edema and improve lymphatic flow, particularly in musculoskeletal injuries and breast cancer–related lymphedema populations. However, evidence remains heterogeneous, with systematic reviews suggesting that KT should be considered an adjunct rather than a substitute for compression-based therapies [21–25]. In contrast, CDT has consistently demonstrated robust efficacy in reducing limb volume and improving functional outcomes across lymphatic disorders, supporting its continued role as the primary conservative intervention [26–28].

The present study contributes novel evidence in a post-liposuction lipedema population, indicating that while both CDT alone and CDT combined with KT are effective, KT does not provide additional statistically significant benefit when applied alongside a fully structured CDT protocol. This finding refines current understanding of postoperative rehabilitation strategies and highlights the importance of distinguishing between additive and primary treatment effects.

Both groups also demonstrated significant improvements in Body Appreciation Scale-2 (BAS-2) scores. This improvement likely reflects a combination of reduced limb volume, improved symmetry following liposuction, and enhanced functional capacity. Given the strong psychosocial burden associated with lipedema, improvements in physical symptoms are closely linked to improved body image and psychological well-being [29]. The absence of between-group differences further suggests that psychological recovery is primarily driven by overall clinical improvement rather than the addition of KT specifically.

LIMITATIONS

This study has several limitations. First, although randomized, the sample size was relatively modest, which may reduce sensitivity for detecting small between-group differences. Second, follow-up duration (16 weeks post-intervention) may not capture long-term recurrence or sustained lymphatic remodeling.

Third, blinding was not feasible due to the nature of the interventions, introducing potential performance bias. Fourth, limb volume estimation relied on circumferential measurement-based equations rather than gold-standard imaging or perometry, which may introduce methodological variability despite standardization.

Finally, psychosocial outcomes were limited to body appreciation, without inclusion of broader quality-of-life, pain, or functional disability instruments.

CLINICAL IMPLICATIONS

The findings of this randomized controlled trial have important implications for postoperative rehabilitation in patients with lipedema following liposuction. Complex decongestive therapy (CDT) should remain the cornerstone of evidence-based management, as it consistently demonstrated significant improvements in lower-limb volume and body appreciation across all follow-up time points.

Importantly, adding kinesio taping (KT) to a fully structured CDT protocol did not yield statistically significant additional benefit. This indicates that routine incorporation of KT into standard postoperative pathways is not clinically justified when CDT is properly delivered, including manual lymphatic drainage, multilayer compression bandaging, therapeutic exercise, and skin care.

From a health economics perspective, avoiding routine KT use may improve cost-efficiency by reducing material consumption, therapist workload, and procedural time without compromising outcomes. This is particularly relevant in resource-limited rehabilitation settings.

Regarding sustainability, minimizing non-essential adjunctive interventions such as KT supports more efficient clinical workflows and reduces disposable material use, contributing to environmentally and operationally sustainable care delivery.

However, KT may still have selective clinical value in cases of compression intolerance or temporary adjunct support during early postoperative phases. Therefore, its role should be individualized rather than routinely prescribed.

Overall, these findings support a CDT-centered, cost-effective, and sustainable rehabilitation model following liposuction in lipedema patients.

CONCLUSION

This randomized controlled trial demonstrated that both complex decongestive therapy (CDT) alone and CDT combined with kinesio taping (KT) produced significant improvements in lower-limb volume and body appreciation in patients with lipedema following liposuction. However, no statistically significant differences were observed between groups, indicating that KT does not provide additional therapeutic benefit beyond a fully implemented CDT protocol.

These findings reinforce CDT as the primary evidence-based postoperative rehabilitation strategy in lipedema due to its consistent effectiveness in managing fluid-dominant edema and improving patient-reported outcomes. Kinesio taping, when used as an adjunct to comprehensive CDT, should not be considered routine care but may be reserved for selected clinical situations where compression therapy is not tolerated or feasible.

Overall, the study supports a structured, CDT-centered, cost-effective, and sustainable rehabilitation approach following liposuction in lipedema patients. Further large-scale, long-term randomized controlled trials are warranted to confirm these findings and optimize individualized rehabilitation protocols.

REFERENCES

1. Aksoy H, Karadag AS, Wollina U. Cause and management of lipedema-associated pain. Dermatol Ther (Heidelb). 2021;34(1): e14364. doi:10.1111/dth.14364.
2. Faria AM, Valerio CM, Barcellos CR, et al. Unraveling lipedema: comprehensive insights and the path to future discoveries. NPJ Metab Health Dis. 2026;4(1):3. doi:10.1038/s44324-025-00093-y.
3. Kamamoto F, Baiocchi JMT, Batista BN, Ribeiro RDA, Modena DAO, Gornati VC. Lipedema: exploring pathophysiology and treatment strategies—state of the art. J Vasc Bras. 2025;23: e20240025. doi:10.1590/1677-5449.202400252.
4. Rabiee A. Lipedema and adipose tissue: current understanding, controversies, and future directions. Front Cell Dev Biol. 2025; 13:1691161. doi:10.3389/fcell.2025.1691161.
5. Athavale A, Fukaya E, Aday AW. Comprehensive approach to management of lipedema. Curr Treat Options Cardiovasc Med. 2025; 27:66. doi:10.1007/s11936-025-01126-x.
6. Heinig B, Wollina U. Komplexe physikalische Entstauungstherapie [Complex decongestive therapy]. Hautarzt. 2015;66(11):810-818. doi:10.1007/s00105-015-3674-1.
7. Atar S, Atar Y, Uygan U, et al. The efficacy of Kinesio taping on lymphedema following head and neck cancer therapy: a randomized, double-blind, sham-controlled trial. Phys Ther Theory Pract. 2023;39(9):1832-1846. doi:10.1080/09593985.2022.2056862.
8. Taylor RJ, Jayasinghe UW, Koelmeyer LA, Ung O, Boyages J. Reliability and validity of upper limb circumference measurements for assessment of lymphedema. Lymphology. 2006;39(4):153-160.
9. Karges JR, Mark BE, Stikeleather SJ, Worrell TW. Concurrent validity of upper-extremity volume estimates: comparison of calculated volume derived from girth measurements and water displacement volume. Phys Ther. 2003;83(2):134-145.
10. Tylka TL, Wood-Barcalow NL. The Body Appreciation Scale-2: item refinement and psychometric evaluation. Body Image. 2015; 12:53-67. doi: 10.1016/j.bodyim.2014.09.006.
11. Lasinski BB. Complete decongestive therapy for treatment of lymphedema. Semin Oncol Nurs. 2013;29(1):20-27. doi: 10.1016/j.soncn.2012.11.004.

12. DalCeredo C, LaCava J, Young R, et al. Effectiveness of kinesiotaping for lymphatic drainage after bilateral total knee arthroplasty: a randomized controlled trial. Medicine (Baltimore). 2025;104(15): e41971. doi:10.1097/MD.0000000000041971.
13. Herbst KL. Rare adipose disorders (RADs) masquerading as obesity. Acta Pharmacol Sin. 2012; 33:155-172. doi:10.1038/aps.2011.153.
14. Lüchinger JE, Pavicic E, Giachino CL, Stute P. Impact of hormones on lipedema development: a systematic literature review. Arch Gynecol Obstet. 2026;313(1):60. doi:10.1007/s00404-026-08318-1.
15. Rapprich S, Dingler A, Podda M. Liposuction is an effective treatment for lipedema-results of a study with 25 patients. J Dtsch Dermatol Ges. 2011;9(1):33-40. doi:10.1111/j.1610-0387.2010.07504. x.
16. Cheville AL, McGarvey CL, Petrek JA, Russo SA, Taylor ME, Thiadens SR. Lymphedema management. Semin Radiat Oncol. 2003;13(3):290-301. doi:10.1016/S1053-4296(03)00035-3.
17. Kim SJ, Yi CH, Kwon OY. Effect of complex decongestive therapy on edema and quality of life in breast cancer patients with unilateral lymphedema. Lymphology. 2007;40(3):143-151.
18. Yoshida S, Koshima I, Imai H, et al. Effect of postoperative compression therapy on the success of liposuction in patients with advanced lower limb lymphedema. J Clin Med. 2021;10(21):4852. doi:10.3390/jcm10214852.
19. Marotta N, Lippi L, Ammendolia V, et al. Efficacy of kinesio taping on upper limb volume reduction in patients with breast cancer-related lymphedema: a systematic review of randomized controlled trials. Eur J Phys Rehabil Med. 2023;59(2):237-247. doi:10.23736/S1973-9087.23.07752-3.
20. Gatt M, Willis S, Leuschner S. A meta-analysis of the effectiveness and safety of kinesiology taping in the management of cancer-related lymphoedema. Eur J Cancer Care. 2017;26: e12510. doi:10.1111/ecc.12510.
21. Alcantara DAA, Santos FNA, Ferreira JJA, Noronha M, Andrade PR. The effect of kinesiotaping on edema: a systematic review and meta-analysis. Musculoskelet Sci Pract. 2024; 74:103.
22. Lanier K, Johnson AM, Tapia X, Samuels S. A retrospective study on kinesiology taping for lower limb edema after femoral fracture. Med Sci Monit. 2022;28: e936619. doi:10.12659/MSM.936619.
23. Tekin E, Bayraktar M, Tortum F, et al. Effectiveness of kinesio taping in acute musculoskeletal injuries in the emergency department: a randomized controlled study. SN Compr Clin Med. 2024; 6:99. doi:10.1007/s42399-024-01731-0.
24. Thomaz JP, Dias TDSM, de Rezende LF. Effect of taping as treatment to reduce breast cancer lymphedema: literature review. J Vasc Bras. 2018;17(2):136-140. doi:10.1590/1677-5449.007217.
25. Smykla A, Walewicz K, Trybulski R, et al. Effect of kinesiology taping on breast cancer-related lymphedema: a randomized single-blind controlled pilot study. Biomed Res Int. 2013; 2013:767106. doi:10.1155/2013/767106.
26. Michopoulos E, Papathanasiou G, Vasilopoulos G, et al. Effectiveness and safety of complete decongestive therapy of phase I: a lymphedema treatment study. Cureus. 2020;12(7): e9264. doi:10.7759/cureus.9264.
27. DiCecco S, Davies CC, Gilchrist L, et al. Complete decongestive therapy phase I: an expert consensus document. Med Oncol. 2024; 41:304. doi:10.1007/s12032-024-02407-4.
28. Brandão ML, Soares HPDS, Andrade MDA, et al. Efficacy of complex decongestive therapy for lymphedema of the lower limbs: a systematic review. J Vasc Bras. 2020;19: e20190074. doi:10.1590/1677-5449.190074.
29. Arndt SF, Kasten E, Klesper B. The effects of surgical lipedema therapy on psychological variables in younger patients between 18 and 35 years. Med Discoveries. 2024;3(2):1126. Available at: https://meddiscoveries.org/pdf/1126.pdf.