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Review Article

Physiotherapy approaches in lipedema: A narrative review

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Abstract

Lipedema is a chronic adipose tissue disorder associated with pain, disproportionate fat accumulation, impaired mobility, and reduced quality of life. Physiotherapy is an important component of conservative management. This review aimed to examine the available evidence on physiotherapy approaches for women with lipedema and their clinical effects. PubMed, Google Scholar, and the Council of Higher Education National Thesis Center were searched for studies published between 2008 and 2026. Clinical studies and master's theses investigating conservative rehabilitation approaches in women with lipedema were included, while review articles, letters to the editor, case reports, and studies without physiotherapy interventions were excluded. The included studies (n = 19) investigated complex decongestive therapy (CDT), manual lymphatic drainage (MLD), compression therapy, intermittent pneumatic compression, exercise, extracorporeal shock wave therapy, vibrotherapy, manual subcutaneous adipose tissue therapy, capacitive and resistive electric transfer (TECAR) therapy, and bioelectrical stimulation. Overall, physiotherapy interventions were associated with improvements in pain, limb circumference or volume, quality of life, and functional outcomes. Compression-based approaches, exercise, and multimodal rehabilitation showed benefits across several clinical outcomes, while emerging device-assisted interventions may provide additional therapeutic options. However, the evidence remains limited by small sample sizes, heterogeneous intervention protocols, and short follow-up periods. Further randomized controlled trials with standardized protocols, adequate sample sizes, and longer follow-up are needed.

Keywords: Lipedema; physical therapy modalities; rehabilitation; manual lymphatic drainage

INTRODUCTION

Lipedema is a chronic adipose tissue disorder predominantly affecting women, characterized by bilateral, symmetrical accumulation of adipose tissue, spontaneous or palpation-induced pain, and easy bruising. It typically develops during hormonal transitions such as puberty, pregnancy, or menopause and primarily affects the lower extremities [1]. Although its pathogenesis remains incompletely understood, current evidence suggests a complex interplay of genetic predisposition, hormonal triggers, microvascular and lymphatic dysfunction, and immunological processes [2].

Lipedema is classified into stages based on changes in skin surface and adipose tissue characteristics. In Stage 1, the skin appears normal despite increased underlying adipose tissue; Stage 2 is characterized by an irregular skin surface and nodules; Stage 3 by large nodules in the skin and subcutaneous tissue; and Stage 4 by lipo-lymphedema [3]. Lipedema can be classified into five types based on anatomical fat distribution: Type I, affecting the pelvis, hips, and thighs; Type II, extending to the knees with medial knee fat pads; Type III, extending from the hips to the ankles; Type IV, involving the arms in addition to the lower body; and Type V, affecting the lower legs [4].

In lipedema management, complex decongestive therapy (CDT) is a commonly used multimodal conservative approach comprising manual lymphatic drainage (MLD), compression therapy, skin care, and exercise [5]. Studies suggest that CDT

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may increase skin elasticity, reduce capillary fragility, improve the venoarterial reflex, and enhance prelymphatic drainage and lymphatic transport [6,7].

Various approaches are used to manage lipedema. These may reduce pain and improve lymphatic function while decreasing vascular leakage, inflammation, and fibrosis [8-10]. MLD aims to support lymphatic circulation and drainage of interstitial fluid. Although substantial interstitial fluid accumulation is not typically present in lipedema, MLD may help reduce pressure sensitivity and pain [11]. Compression therapy may help manage pain and other subjective symptoms; however, evidence regarding its use in early-stage lipedema remains conflicting [7,10,12-14].

The aim of this review was to examine the available literature on physiotherapy approaches for women with lipedema and to summarize their reported effects on clinical outcomes.

Literature Search

A narrative literature search was conducted to identify studies in English or Turkish evaluating physiotherapy approaches in women with lipedema. PubMed, Google Scholar, and the Turkish National Thesis Center were searched between July 1 and July 15, 2026, without a predefined publication-year restriction. The following keywords and their Turkish equivalents were used: "(lipedema OR lipoedema OR lipolymphedema) AND (therapy OR treatment OR management OR rehabilitation OR physiotherapy OR physical therapy OR conservative treatment OR non-surgical treatment)." The search identified 28 records across the sources. Additional studies were identified through backward citation searching of reference lists. After applying the eligibility criteria, 19 studies were included in the narrative synthesis. The earliest eligible study was published in 2008; therefore, the included studies covered the period from 2008 to 2026. Studies investigating physiotherapy interventions in women with lipedema were included, whereas reviews, letters to the editor, case reports, and studies that did not evaluate physiotherapy interventions were excluded.

The included studies (n = 19) comprised randomized controlled trials, pilot studies, prospective and uncontrolled clinical studies, and postgraduate theses, with sample sizes ranging from 5 to 405 women. Most included women with Stage I–III lipedema. The interventions were heterogeneous and included CDT, MLD, compression therapy, Intermittent pneumatic compression therapy (IPCT), exercise, and other emerging technologies (Table 1). Pain and limb circumference or volume were the most frequently assessed outcomes, with beneficial effects reported for CDT, compression, pneumatic compression, and device-assisted approaches (Table 2).

Table 1. Characteristics of manual and device-assisted physiotherapy interventions applied in the studies

Author(s)	Experimental group	Control group	Duration	Research design	Sample	Outcome assessment tools
Kuzucu (2023) [15]	CDT	CDT	Mean duration: 3–6 weeks (5 sessions/ week, 45–60 min/session)	Prospective clinical study	Stage II–III secondary lower-extremity lymphedema (n = 26) Stage I–III primary lower-extremity lipedema (n = 26)	Pain (VAS), limb circumference (frustum method), quality of life (LYMQOL-L), functional capacity (6MWT, LEFS), Sedentary Behavior Questionnaire, Social Appearance Anxiety Scale
Türköz (2024) [16]	ESWT alone; CDT alone; ESWT followed by CDT in the same session		2 weeks (3 sessions/ week)	Prospective, randomized, and controlled	Stage I–III lipedema, Types 2–3 (n = 33)	Pain (VAS), limb volume, quality of life (NSP), and body composition (Dual-Energy X-ray Absorptiometry (DXA))
Bruno and Cilluffo, (2026) [17]	Postoperative (after liposuction): SWT sessions three times per week for 3 weeks, starting 7 days after surgery	Control group: patients who did not receive SWT	3 weeks (3 sessions/week)	Prospective controlled study	Stage II–III lipedema patients who underwent power-assisted liposuction (PAL) (n = 50); control group with lipedema (n = 25)	Pain and satisfaction (patient-reported outcomes), fibrosis severity, skin elasticity measurements (US)

Abbreviations: 6MWT, 6-minute walk test; BIA, bioelectrical impedance analysis; BMI, body mass index; CDP, complete decongestive physiotherapy; CDT, complex decongestive therapy; DLQI, Dermatology Life Quality Index; DXA, dual-energy X-ray absorptiometry; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; LBPS, lower body pain score; L-Dex, lymphedema index; LEFS, Lower Extremity Functional Scale; LYMQOL-Leg, Lymphedema Quality of Life Questionnaire–Leg; MLD, manual lymphatic drainage; MRI, magnetic resonance imaging; NRS, numeric rating scale; PAL, power-assisted liposuction; PCD, pneumatic compression device; PHQ-9, Patient Health Questionnaire-9; PLC, Profil der Lebensqualität chronisch Kranker; PRS, pain rating scale; PSFS, Patient-Specific Functional Scale; PROMIS, Patient-Reported Outcomes Measurement Information System; RAND SF-36, RAND 36-Item Health Survey; RPS, Ricolfi–Patton score (total body pain score); SAT, subcutaneous adipose tissue; SF-36, Short Form-36 Health Survey; SWT, shock wave therapy; TECAR, capacitive and resistive electric transfer; UBPS, upper body pain score; US, ultrasound; VAS, visual analog scale; VRS, verbal rating scale; WAL, water-assisted liposuction; WHOQOL-BREF, World Health Organization Quality of Life–BREF; WHR, waist-to-hip ratio; WHtR, waist-to-height ratio.

Table 1. Characteristics of manual and device-assisted physiotherapy interventions applied in the studies

Author(s)	Experimental group	Control group	Duration	Research design	Sample	Outcome assessment tools
Podda et al., 2021 [18]	Liposuction (PAL or WAL techniques) + CDT as needed	12 months of CDT alone	36-month follow-up (primary assessment at 12 months)	Randomized controlled multicentre investigator-blinded trial	Women with lipedema (n = 405); randomized 2:1 to liposuction and CDT groups	Pain (German Pain Questionnaire), limb circumference (tape measure), quality of life (SF-36, DLQI, WHOQOL-BREF), functional status (LEFS), depression (PHQ-9)
Atan and Bahar-Özdemir, (2021) [19]	Group 1: CDT + exercise; Group 2: IPCT + exercise, five sessions/week for 6 weeks	Group 3: (exercise only); all groups completed 30 sessions of a combined exercise program (aerobic, strengthening, and stretching exercises)	6 weeks (5 sessions/ week)	Randomized controlled trial	Women with Type 3, Stage III–IV lipedema (n = 33); Groups 1, 2, and 3	Pain (VAS), limb volume (4-cm intervals from the ankle to the thigh), quality of life (SF-36), anthropometry (body weight, body mass index, waist-to-height ratio, waist-to-hip ratio), functional capacity (6MWT), Beck Depression Inventory, Fatigue Severity Scale
Wright et al. (2023) [20]	Pneumatic compression devices + conservative care	Conservative care (manual lymphatic drainage (MLD), compression stockings, dietary counseling, and self-care education)	12 weeks (60-min pneumatic compression session daily)	A proof-of-principle single-center, open-label, industry-sponsored, randomized trial	Women with bilateral lipedema and secondary lymphedema (initial n = 36; 10 lost to follow-up or withdrew); pneumatic compression devices + conservative care (n = 12) and conservative care alone (n = 14)	Pain (PROMIS Pain Interference, Wong-Baker Faces, NRS), circumference measurements (lower extremities and trunk; Gulick II tape measure), quality of life (RAND SF-36), body composition (InBody 770 BIA), mobility (PROMIS Mobility 2.0 questionnaire), symptoms (perceived swelling, heaviness, pain, fatigue, tenderness, and tightness; NRS)
Schneider (2020) [21]	MLD + low-frequency vibrotherapy	MLD Only	3 weeks, 2 sessions/week (6 sessions total, 30 min/ session)	A two-armed, randomized, controlled pragmatic trial	Women with stage II–III lipedema referred for physiotherapy (n = 30), randomly assigned to an MLD group or a combined MLD and vibrotherapy group.	Circumference measurements (tape measure), quality of life in patients with chronic diseases (PLC)
Ricolfi et al. (2024) [22]	Elastic compression leggings with micromassage properties + moderate-intensity physical activity (1-hour walk + daily activities); leggings were worn for at least 3 hours/day		4 weeks, ≥ 3 hours/day of leggings use	Pilot observational study (prospective, single-group pre–post design)	Women with Type 3, Stage I–III lipedema (n = 29); no previous decongestive therapy or use of medical compression	Pain (VRS, LBPS, UBPS, Total Body Pain Score/Ricolfi–RPS), Limb volume (Kuhnke disk method), anthropometry (body weight, height, waist, and hip circumference), skin and subcutaneous adipose tissue thickness (US), symptoms (17-item symptom questionnaire; VRS-Likert)

Abbreviations: 6MWT, 6-minute walk test; BIA, bioelectrical impedance analysis; BMI, body mass index; CDP, complete decongestive physiotherapy; CDT, complex decongestive therapy; DLQI, Dermatology Life Quality Index; DXA, dual-energy X-ray absorptiometry; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; LBPS, lower body pain score; L-Dex, lymphedema index; LEFS, Lower Extremity Functional Scale; LYMQOL-Leg, Lymphedema Quality of Life Questionnaire–Leg; MLD, manual lymphatic drainage; MRI, magnetic resonance imaging; NRS, numeric rating scale; PAL, power-assisted liposuction; PCD, pneumatic compression device; PHQ-9, Patient Health Questionnaire-9; PLC, Profil der Lebensqualität chronisch Kranker; PRS, pain rating scale; PSFS, Patient-Specific Functional Scale; PROMIS, Patient-Reported Outcomes Measurement Information System; RAND SF-36, RAND 36-Item Health Survey; RPS, Ricolfi–Patton score (total body pain score); SAT, subcutaneous adipose tissue; SF-36, Short Form-36 Health Survey; SWT, shock wave therapy; TECAR, capacitive and resistive electric transfer; UBPS, upper body pain score; US, ultrasound; VAS, visual analog scale; VRS, verbal rating scale; WAL, water-assisted liposuction; WHOQOL-BREF, World Health Organization Quality of Life–BREF; WHR, waist-to-hip ratio; WHtR, waist-to-height ratio.

Table 1. Characteristics of manual and device-assisted physiotherapy interventions applied in the studies

Author(s)	Experimental group	Control group	Duration	Research design	Sample	Outcome assessment tools
Herbst et al. (2017) [23]	Whole-body manual subcutaneous adipose tissue (SAT) therapy		4 weeks, 12 sessions total (90 min/ session)	Single-arm prospective pilot study	Lipedema (n = 7)	Pain, leg volume (circumference measurements using a measurement grid), body composition (DXA), Functional status (LEFS), SAT structure (US; Vevo 2100), Body Shape Questionnaire
Szolnoky et al. (2008) [7]	Complete decongestive physiotherapy (30 min) + IPC (30 min) + physical exercise	Complete decongestive physiotherapy (60 min) + physical exercise	5 days, 1 session/day	Prospective randomized controlled pilot study	Women with lipedema (n = 24); CDT group (n = 11) and CDT + IPC group (n = 13)	Limb volume (Kuhnke's disc method)
Casart Quintero et al. (2025) [24]	TANIT platform incorporating dampened bioactive current, functional dermal stimulation, and mechanical stimulation		5 weeks, 1 session/week	Single-center, uncontrolled pre–post clinical study	Women with Stage I–II lipedema (n = 23)	Pain threshold, lower-extremity volume, anthropometric measurements, adipose tissue thickness (US), blood tests, patient satisfaction
Elio et al. (2014) [25]	Bioresonance microcurrents combined with transdermal delivery of active principles (Transponder® device)		6 days, 6 sessions total	Pilot study	Patients with lower-extremity lymphedema and/or lipedema (n = 8)	Symptom (VAS; pain, heaviness, dysesthesia, diuresis), limb volume (tape measure), body composition (L-DEX), symptom assessment
Donahue et al. (2022) [26]	Multimodal physiotherapy (MLD + manual therapy + negative pressure therapy + exercise + education + compression)		6 weeks, 9 sessions total	Proof-of-principle study	Women with Stage I–II lipedema and Stage 0–I lymphedema (n = 5)	Pain (VAS), quality of life (RAND-36 Health Survey), biophysical/anthropometric measurements, functional status (PSFS), 3T sodium, water MRI
Uzun et al. (2025) [27]	TECAR therapy + standard care (compression garments and structured exercise program)	Standard care (compression garments and structured exercise program)	TECAR: 3 weeks, 2 sessions/week, 6 sessions total, 15 min/session	Prospective randomized controlled study	Women with Stage II lipedema (n = 30); TECAR + standard care (n = 15) and standard care (compression + exercise) control group (n = 15)	Pain (VAS), circumference measurements (tape measure), quality of life (LYMQOL-Leg), BMI, Functional status (LEFS)

Abbreviations: 6MWT, 6-minute walk test; BIA, bioelectrical impedance analysis; BMI, body mass index; CDP, complete decongestive physiotherapy; CDT, complex decongestive therapy; DLQI, Dermatology Life Quality Index; DXA, dual-energy X-ray absorptiometry; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; LBPS, lower body pain score; L-Dex, lymphedema index; LEFS, Lower Extremity Functional Scale; LYMQOL-Leg, Lymphedema Quality of Life Questionnaire–Leg; MLD, manual lymphatic drainage; MRI, magnetic resonance imaging; NRS, numeric rating scale; PAL, power-assisted liposuction; PCD, pneumatic compression device; PHQ-9, Patient Health Questionnaire-9; PLC, Profil der Lebensqualität chronisch Kranker; PRS, pain rating scale; PSFS, Patient-Specific Functional Scale; PROMIS, Patient-Reported Outcomes Measurement Information System; RAND SF-36, RAND 36-Item Health Survey; RPS, Ricolfi–Patton score (total body pain score); SAT, subcutaneous adipose tissue; SF-36, Short Form-36 Health Survey; SWT, shock wave therapy; TECAR, capacitive and resistive electric transfer; UBPS, upper body pain score; US, ultrasound; VAS, visual analog scale; VRS, verbal rating scale; WAL, water-assisted liposuction; WHOQOL-BREF, World Health Organization Quality of Life–BREF; WHR, waist-to-hip ratio; WHtR, waist-to-height ratio.

Table 1. Characteristics of manual and device-assisted physiotherapy interventions applied in the studies

Author(s)	Experimental group	Control group	Duration	Research design	Sample	Outcome assessment tools
Czerwińska et al. (2024) [12]	Class II flat-knit compression leggings + multimodal exercise program (breathing, aerobic, strengthening, balance, and stretching exercises)	The same exercise program (without compression)	8 weeks, 3 sessions/week	Prospective randomized controlled study	Women with lipedema (n = 24); compression + exercise group (n = 12) and exercise-only group (n = 12)	Symptom severity assessment (0–10 numerical rating scale; pain, tenderness, heaviness in the extremities, bruising, trunk-to-hip disproportion, hip/thigh adipose tissue accumulation, lower-extremity swelling, and impact on activities of daily living), limb circumference (ViALUX 3D), quality of life (SF-36), body composition (Tanita BC-545N BIA), anthropometri (BMI, waist circumference, hip circumference, WHtR)
Szolnoky et al. 2011 [14]	MLD + IPC + multilayer short-stretch bandaging	The control group uses moisturizer only	5 days, 1 session/day	Prospective controlled study	Women with lipedema (n = 38); treatment group (n = 19) and control group (n = 19)	Pain (10-item pain questionnaire, PRS, Wong-Baker Faces Scale), lower-extremity volume (Kuhnke's disc method)
Czerwińska et al. 2023 [28]	Exercise + Class II flat-knit compression leggings (≥ 12 hours/day)	Exercise only	6 weeks (3 sessions/ week for the first 4 weeks, followed by a home-based program for the final 2 weeks)	Pilot randomized controlled trial	Women with Stage I–III lipedema (n = 6); exercise group (n = 3) and exercise + compression group (n = 3)	Pain (VAS, pain on palpation), limb circumference, quality of life (SF-36), anthropometry (body weight, BMI, WHR), skin and subcutaneous adipose tissue thickness (US; Honda Electronics HS-2100), symptom severity questionnaire (0–10 scale)
Mortimer et al. (2024) [29]	LymphActiv digital physical activity program	Non-completers (quasi-control)	24 weeks	Observational cohort study	Mixed lymphedema/ lipedema cohort (n = 55; 37 completers)	Physical activity, body weight, lower-limb volume, and quality of life
Sakızlı Erdal et al. (2026) [30]	Supervised multimodal aerobic and strengthening exercise program	Physical activity and lipedema management education	6 weeks (2 sessions/ week)	Randomized controlled trial	Women with lipedema (n = 22; 11 per group)	Edema (limb circumference and local tissue), pain (VAS), pressure pain threshold (algometer), functional exercise capacity (6MWT), lower-extremity muscle strength (handheld dynamometer), strength/endurance (sit-to-stand test), and lower-extremity function (LEFS)

Abbreviations: 6MWT, 6-minute walk test; BIA, bioelectrical impedance analysis; BMI, body mass index; CDP, complete decongestive physiotherapy; CDT, complex decongestive therapy; DLQI, Dermatology Life Quality Index; DXA, dual-energy X-ray absorptiometry; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; LBPS, lower body pain score; L-Dex, lymphedema index; LEFS, Lower Extremity Functional Scale; LYMQOL-Leg, Lymphedema Quality of Life Questionnaire–Leg; MLD, manual lymphatic drainage; MRI, magnetic resonance imaging; NRS, numeric rating scale; PAL, power-assisted liposuction; PCD, pneumatic compression device; PHQ-9, Patient Health Questionnaire-9; PLC, Profil der Lebensqualität chronisch Kranker; PRS, pain rating scale; PSFS, Patient-Specific Functional Scale; PROMIS, Patient-Reported Outcomes Measurement Information System; RAND SF-36, RAND 36-Item Health Survey; RPS, Ricolfi–Patton score (total body pain score); SAT, subcutaneous adipose tissue; SF-36, Short Form-36 Health Survey; SWT, shock wave therapy; TECAR, capacitive and resistive electric transfer; UBPS, upper body pain score; US, ultrasound; VAS, visual analog scale; VRS, verbal rating scale; WAL, water-assisted liposuction; WHOQOL-BREF, World Health Organization Quality of Life–BREF; WHR, waist-to-hip ratio; WHtR, waist-to-height ratio.

Table 2. Key findings of conservative and device-based physiotherapy interventions in lipedema

Author(s)	Key findings
Kuzucu (2023) [15]	CDT reduced pain and limb circumference while improving walking capacity, sedentary behavior, and quality of life; however, lower-extremity functional status did not significantly improve in the lipedema group.
Türköz (2024) [16]	ESWT, CDT, and their combination improved pain, lower-extremity volume, pressure pain threshold, and quality of life, with no significant differences between interventions.
Bruno and Cilluffo (2026) [17]	In patients undergoing liposuction for lipedema, post operative SWT was associated with reduced fibrosis and pain, improved skin elasticity, and greater patient satisfaction compared with controls.
Podda et al. (2021) [18]	Results have not yet been published
Atan and Bahar-Özdemir (2021) [19]	All programs improved outcomes; however, CDT + exercise resulted in greater improvements in limb volume, pain, and physical function than IPCT + exercise or exercise alone.
Wright et al. (2023) [20]	In women with lipedema and secondary lymphedema, pneumatic compression combined with conservative care was associated with improvements in limb circumference, bioimpedance measurements, and selected pain-related outcomes.
Schneider (2020) [21]	Adding low-frequency vibrotherapy to MLD produced greater reductions in limb volume and improvements in quality of life than MLD alone.
Ricolfi et al. (2024) [22]	Physical activity combined with elastic micromassage compression garments reduced pain, symptom scores, lower-extremity volume/circumference, and skin and subcutaneous adipose tissue thickness on ultrasound.
Herbst et al. (2017) [23]	Manual SAT therapy reduced pain and improved subcutaneous adipose tissue structure, lower-extremity function, and limb circumference.
Szolnoky et al. (2008) [7]	Adding IPC to CDT reduced limb circumference; however, it provided no significant additional benefit for volume reduction. IPC was safe.
Casart Quintero et al. (2025) [24]	The TANIT platform improved pain, patient satisfaction, and body composition.
Elio et al. (2014) [25]	Limb volume and L-Dex values improved, while pain, heaviness, and dysesthesia decreased, with no serious adverse events reported.
Donahue et al. (2022) [26]	In an uncontrolled pilot study of five women with early-stage lipedema and concomitant early-stage lymphedema, multimodal physiotherapy was associated with improvements in pain and physical function, while changes in quality of life and tissue sodium levels were not statistically significant.
Uzun et al. (2025) [27]	Adding TECAR therapy to standard care reduced pain and lower-extremity circumference and improved functional status and quality of life. Pain reduction was significant at one month but was not maintained at three months.
Czerwińska et al. (2024) [12]	Compression therapy improved physical functioning and energy/fatigue domains of quality of life and reduced limb heaviness, trunk-to-limb disproportion, and swelling. Limb circumference decreased in both groups.
Szolnoky et al. (2011) [14]	MLD + IPC + multilayer short-stretch bandaging reduced pain severity, leg volume, and capillary fragility, whereas only PRS scores significantly decreased in the control group.
Czerwińska et al. (2023) [28]	The pilot study suggested that adding compression garments to exercise may improve pain, quality of life, and limb circumference.
Mortimer et al. (2024) [29]	LymphActiv completers showed increased activity and slight reductions in leg volume and body weight.
Sakızlı Erdal et al. (2026) [30]	Exercise improved pain, capacity, strength, endurance, and function, without significant between-group differences.

Abbreviations: CDT, complex decongestive therapy; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; MLD, manual lymphatic drainage; PRS, pain rating scale; SAT, subcutaneous adipose tissue; SWT, shock wave therapy.

Compression Approaches

Compression-based interventions were among the most frequently studied approaches. Atan and Bahar-Özdemir reported greater improvements in limb volume, pain, and selected quality-of-life domains with CDT plus exercise than with IPCT plus exercise or exercise alone [19]. Pneumatic compression added to conservative treatment also improved limb circumference, bioimpedance measures, and pain-related quality of life in women with lipedema and secondary lipolymphedema [20]. CDT with or without IPCT reduced lower-extremity volume, with no additional volume benefit from IPCT [7], while MLD combined with intermittent pneumatic compression and bandaging reduced pain and limb volume [14]. Compression combined with exercise also improved pain, limb circumference, quality of life, and tissue thickness [12,22,28].

Manual and Device-Assisted Therapies

Combining vibrotherapy with MLD resulted in greater limb volume reduction and improved quality of life compared with MLD alone [21]. Manual subcutaneous adipose tissue (SAT) therapy reduced pain and limb volume and improved lower-extremity function [23]. Extracorporeal shock wave therapy (ESWT), CDT, and their combination improved pain, pressure pain threshold, limb volume, and quality of life, without significant differences between approaches [16]. Postoperative shock wave therapy (SWT) also reduced fibrosis and pain and improved skin elasticity and satisfaction [17]. Shockwave interventions may have a complementary role, but limited evidence and heterogeneous protocols preclude conclusions on optimal parameters.

Bioelectrical Stimulation and Device-Assisted Approaches

Bioresonance microcurrents with transdermal delivery reduced limb volume, pain, heaviness, and dysesthesia and improved symptom severity and bioimpedance measures [25]. TANIT increased pain threshold and reduced lower-extremity volume and adipose tissue thickness, with high patient satisfaction after five weeks [24]. Adding capacitive and resistive electric transfer (TECAR) to standard care improved pain, functional status, and quality of life [27]. However, small samples and heterogeneous protocols limit generalizability.

Exercise and Multimodal Physiotherapy Approaches

A supervised multimodal aerobic and strengthening program was associated with clinical improvements in exercise capacity, lower-extremity strength, endurance, function, and pain; however, no significant between-group differences were found [30]. Among program completers in a mixed cohort of patients with lymphedema and lipedema, LymphActiv participation was associated with increased physical activity and small reductions in lower-limb volume and body weight; however, diagnosis-specific effects were not reported [29]. A multimodal program combining MLD, manual therapy, negative pressure therapy, exercise, education, and compression improved pain, functional capacity, and quality of life [26].

Comorbidities such as obesity, venous disease, and lymphatic disorders may complicate rehabilitation. Although lipedema and obesity have distinct pathophysiological mechanisms, obesity-related mobility limitations and lymphedema may increase functional and symptom burden [31-33]. Delayed lymphatic drainage has also been reported in advanced or mixed forms of lipedema [34]. Therefore, treatment should be individualized according to disease stage, clinical presentation, lymphatic status, physical activity, and relevant comorbidities.

Rehabilitation interventions tailored to individual needs can be incorporated into the process; additionally, emerging physical agent modalities may be considered as complementary options. Key clinical issues and physiotherapy approaches are summarized in Table 3.

Table 3. Major clinical problems in lipedema and corresponding physiotherapy approaches

Clinical problem	Approaches used in the literature
Predominant pain	CDT, MLD, SAT therapy, ESWT [16,17,19,21,23]
Increased limb volume or circumference	CDT, compression therapy, IPC [7,19,20]
Concomitant lipolymphedema	CDT combined with IPC/PCD [15,20]
Fibrotic tissue changes	SWT/ESWT, SAT therapy [17,23]
Physical inactivity	Digital physical activity interventions, exercise programs [29]
Reduced functional capacity	Exercise-based rehabilitation, multimodal physiotherapy [19,23,26,30]
High symptom burden	Multimodal Conservative Rehabilitation Programs [26]

Abbreviations: CDT, complex decongestive therapy; ESWT, extracorporeal shock wave therapy; IPC, intermittent pneumatic compression; MLD, manual lymphatic drainage; PCD, pneumatic compression device; SAT, subcutaneous adipose tissue; SWT, shock wave therapy.

CONCLUSION

The available evidence suggests that physiotherapy interventions may improve pain, limb volume, quality of life, and functional outcomes in women with lipedema. Compression, exercise, MLD, and multimodal rehabilitation may be beneficial in selected populations, whereas emerging modalities such as ESWT, vibrotherapy, bioelectrical stimulation, and TECAR may offer additional therapeutic options. However, the evidence is limited by small sample sizes, heterogeneous intervention protocols, variable treatment durations and outcome measures, and a limited number of randomized controlled trials. Therefore, physiotherapy should be individualized according to disease stage and severity, predominant symptoms, lymphatic status, functional capacity, physical activity level, and comorbidities. Larger randomized controlled trials with standardized protocols, longer follow-up periods, and clearly defined outcomes are needed to determine the optimal type, dose, frequency, and duration of physiotherapy interventions for lipedema.

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