Supplementary Table SI. Characteristics of the included studies

Authors [years]	Subjects (*n*)	Study design	Inclusion criteria	Interventions	Laser device/ parameter	Outcomes measurement	Follow up	conclusion
Yilmaz and Ayhan, 2023) [18]	45	3 groups Randomized trial	• Unilateral, stage I–III BC, unilateral stage II arm lymphedema • Arm volume difference of 5–20% on the affected side after BC surgery	• G1 manual lymphatic drainage MLD • G2 kinesio-taping • G3 low-level laser therapy	• (BTL-5000®, BTL industries Ltd. Hertfordshire, UK) • GalliumAluminum-Arsenid laser (Ga-Al-As • A power density of 30 mW/cm^2 and a square centimetre density of 1.5 J/cm^2 for 1 min) • 12 points/20 min	• Shoulder joint ROM, • Quick-disability of arm, shoulder and hand for arm disability • Pain • Quality of life for arm lymphedema (LYMQOL-arm)	4- and 12-week follow-up	Kinesio-taping and low-level laser led to better results than MLD in stage II breast cancer-related lymphoedema at the 12th week of follow-up
Kozanoglu *et al.*, 2022 [19]	42	2 groups Single-blinded, controlled clinical trial.	• Arm lymphoedema • Modified radical mastectomy with complete axillary dissection. • Lymphedema at least for 3 months	• G1 intermittent pneumatic compression IPC plus LLLT (*n* = 21) • G2 only IPC (*n* = 21). • 5 sessions per week/ 4 weeks	• (Electronica Pagani IR27/4) • Ga-As 904 nm • 2800 Hz, 1.5 J/cm^2 • 10 points/20 min	• Pain • Grip strength • Circumference	3rd, 6th, and 12th months follow up	Both combined IPC and LLLT, and IPC therapy alone had positive effects on the reduction of arm volume, handgrip strength, and pain immediately after the therapy and in short and long term
Kilmartin *et al.*, 2020 [28]	22	2 groups A pilot, double-blind, randomized, placebo-controlled study	• Stage II or III unilateral secondary lymphedema • Unilateral mastectomy and lymph node dissection • Breast reconstruction	• G1 active laser + CDT • G2 Placebo laser + CDT	• (the LTU-904 laser by RianCorp) • 1.5 J/cm^2, for a total dose of 15 J/cm^2 • 1 min at each of 10 sites in the axilla	• Lymphedema symptoms, distress, and limb volume	3rd, 6th, and 12th months follow up	Significant benefit of LLLT in combination with CDT for symptom reduction in individuals with BCRL but did not show additional benefit for limb volume reduction
Mogahed *et al.*, 2020 [20]	30	2 groups Randomized controlled study	• (Stage II, III) secondary lymphedema • Modified radical mastectomy with axillary lymph node dissection	• G1 LLL + (manual lymphatic drainage, shoulder ROM ex and pneumatic compression • G2 (Control): placebo laser therapy + manual lymphatic drainage, shoulder ROM ex. 3times/w /12w	• (Bravo Terza Serie, Model D; ASA S.r.l., Vicenza, Italy) • A wavelength of 905 nm/24 mW – frequency varying from 1 to 10,000 Hz. A dose of 2 J/cm^2	• Pain • Lymphedema volume	3rd month follow up	Low level laser diode therapy had a valuable effect on the treatment of post-mastectomy lymphedema and pain

Supplementary Table SI. Cont.

Authors [years]	Subjects (*n*)	Study design	Inclusion criteria	Interventions	Laser device/ parameter	Outcomes measurement	Follow up	conclusion
Mokhtar *et al.*, 2020 [21]	40	2 groups Randomized controlled study	• Unilateral post mastectomy grade 2 or 3 lymphedema	• G1 CDT. • G2 LLLT	• (Unhiply technology, Belgium. Laser Phyaction CL-904) - Pulse peak power of 13, 5 W, pulse frequency: 2–30,000 Hz, maximum average power of 70, 5mW and energy per pulse of 2, 35 mJ	• Arm circumference health • Related quality of life (HRQL)	NA	Significant improvement of LLLT more than CDT
Baxter *et al.*, 2018 [22]	20	2 groups Double-blinded randomized controlled trial	• Unilateral PML • BCRL (circumference increase over 7.5%)	• G1 Active laser + BCRL conventional therapy • G2 Placebo laser + BCRL conventional therapy • Twice/week/6 week	• LightForce1 EX; model No.: LTS-1500 • (Wavelength: 980/810 nm (80 : 20 ratio); output power: 500 mW beam spot size: 5 cm^2; irradiance: 100 mW/cm^2; treatment time per area: 1 min dosage per area treated: 30 J (6 J/cm^2) • 10 points 1 min for each	• Limb circumference • Pain and heaviness • Psychological impacts • Activity disability	12 week follow up	LLLT in addition to conventional treatment is more effective in the management of BCRL

Supplementary Table SI. Cont.

Authors [years]	Subjects (*n*)	Study design	Inclusion criteria	Interventions	Laser device/ parameter	Outcomes measurement	Follow up	conclusion
Storz *et al.*, 2017 [23]	40	2 groups A randomized placebo-controlled trial	• Unilateral arm lymphoedema after treatment for breast cancer • Modified radical mastectomy or breast-conserving surgery	• G1 active laser • G2 placebo laser • 2 times/week/4 weeks	• IMELAS Vital' (Schwa-medico, medizinische ApparateVer-triebsgesellschaft mbH, Ehringshau-sen, Germany) • Wavelength of 980 nm (near infrared light) and power output 640 mW, cluster laser covering a beam area of 78.54 cm^2. Energy was 384 J/ energy density of 4.89 J/cm^2	• Pain • Quality of life, grip strength – limb volume	4, 8 and 12 weeks	Laser therapy may be effective in reduction of arm volume, but no significant results were seen
Bramlett *et al.*, 2014 [27]	14	2 groups A double-blind, randomized, placebo-controlled study	• Unilateral mastectomy • Unilateral upper limb lymphedema; fluid volume that is greater to 200 ml	• G1 active laser + CDT • G2 sham laser + CDT 2 times/week	• LTU-904 infrared laser manufactured by RianCorp (Marleston, South Australia) wavelength of 904 nm	• Arm circumference, volume, and pain	1, 3, 6, 12, and 18 months	Laser therapy may be effective in reduction of arm volume
Khalaf *et al.*, 2013 [26]	30	2 groups Randomized, controlled Study	• Modified radical mastectomy • Lymphedema of the upper limb secondary to breast cancer surgery	• G1 laser therapy + CDT. • G2 placebo laser therapy + CDT • 3 time/week/6 week	• (Frequency: 5000 Hz, duration: 15 min, pulse duration: 50 ns, power intensity: 5 mW, wave length: 632.8 nm and dosage: 1.5 J/cm^2) • 17 points	• Limb volume • Shoulder mobility	NA	Laser therapy has a positive effect in reducing post mastectomy lymphedema and increasing range of motion of shoulder joint

Supplementary Table SI. Cont.

Authors [years]	Subjects (*n*)	Study design	Inclusion criteria	Interventions	Laser device/ parameter	Outcomes measurement	Follow up	conclusion
Ridner *et al.*, 2013 [24]	46	3 groups Pilot randomized trial	• Stage I or II lymphedema	• G1 manual lymphatic drainage (MLD) for 40 min • G2 LLLT for 20 min • G3 20 min of MLD + LLLT 20 min/8 months	• LLL • RianCorp LTU 904	• Limb volume, • Extracellular fluid • Symptoms • Quality of life (QOL)	NA	LLLT with bandaging may offer a time-saving therapeutic option to conventional MLD. Alternatively, compression bandaging alone could account for the demonstrated volume reduction
Ahmed Omar *et al.*, 2011 [25]	50	2 groups Double blind placebo control randomized study	• Post mastectomy lymphedema • Breast cancer surgery including axillary node dissection for stages II or III breast cancer	• G1 laser therapy • G2 placebo laser three times a week for 12 weeks	• (RianCorp Pty Ltd., Henley Beach, South Australia, Pagani IR27/4) • (Ga-As, wavelength of 904 nm, power of 5 mW, and spot size of 0.2 cm^2 average of 1.5 J/cm^2 dosage	• Circumference • Limb volume • Shoulder mobility • Hand grip	4, 8, and 12 weeks	Laser treatment was found to be effective in reducing the limb volume, increase shoulder mobility, and hand grip strength in patients with postmastectomy lymphedema

BCRL – breast cancer-related lymphoedema, CDT – complete decongestive therapy, G – group.

Supplementary Table SII. PEDro scores for the included trails

Authors [years]	Pedro scale											
	Eligibility criteria	Random allocation	Concealed allocation	Baseline comparability	Blind subjects	Blind therapists	Blind assessors	Adequate follow-up	Intention-to-treat analysis	Between-group comparisons	Point estimates and variability	Total score
Yilmaz and Ayhan, 2023 [18]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	6
Kozanoglu *et al.*, 2022 [19]	Yes	Yes	No	Yes	No	No	No	No	No	Yes	Yes	4
Kilmartin *et al.*, 2020 [28]	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	7
Mogahed *et al.*, 2020 [20]	Yes	Yes	No	Yes	Yes	No	No	No	No	Yes	No	4
Mokhtar *et al.*, 2020 [21]	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	No	4
Baxter *et al.*, 2018 [22]	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	7
Storz *et al.*, 2017 [23]	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	7
Bramlett *et al.*, 2014 [27]	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	7
Khalaf *et al.*, 2013 [26]	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	5
Ridner *et al.*, 2013 [24]	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes	Yes	5
Ahmed Omar *et al.*, 2011 [25]	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	7