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Supplement 4. Characteristics of included studies.

| Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
Alexanderson, et al. [1]; 2014; single-subject experimental design with repeated measures; Sweden	SSc ♀ IG n=3 ♂ IG n=1	Intensive aerobic exercise and muscle endurance training program; 1) Function	1) Six Minute walk test (6MWT)	n=4 Median age = 66.5 (range 41–69)	n.a.	After eight weeks of exercise, no participant showed a statistically significant change in physical walking distance during the 6MWT.	No adverse events have occurred.
Allaire, et al. [2]; 2005; RCT; USA	SLE[②Ω▽] IG n=122[②] CG n=120[②] Mean age = 49.49 (±9.19)	Job retention intervention; 1) Time to the first job loss	1) Two types of job loss events: permanent job loss, consisting of permanent disability or premature retirement; and temporary job loss, consisting of a period of unemployment.	n=122[②]	n=120[②] Same written materials	In this study, patients with different diseases were investigated. Since no subgroup analyses were presented in the article, the effectiveness findings refer to a mixed population, which makes a conclusion related to people with SLE only impossible.

Overall 73 permanent or temporary job loss events in the full sample over 48 months of follow-up: 25 IG and 48 CG; permanent job losses alone, 12 IG vs 22 CG; temporary job losses alone, 13 IG vs 26 CG. In the Poisson regression analysis, persons in the IG had a 49% (confidence interval 17–69%, p = .007) reduction in the total number of permanent and temporary job losses compared to CG. Time to job loss: At 12 months post-intervention, a greater percentage of participants of IG remained employed compared to participants in the CG. The difference increased at 18 months, was sustained over 42 months, and was significant by the log-rank statistical test, p = .03. After 24 months, the numbers of job losses are more or less equal in the two groups; however, the cumulative job loss at 48 months is greatest in the control group. | Not reported in the article. |
| Antonioli, et al. [3]; 2009; quasi-experimental study; Italy | SSc ♀ IG n=16 ♀ CG n=17 ♂ CG n=1 | individualized rehabilitation program; primary outcome was not specified, 1) Functioning 2) Quality of life 3) Impaired health and perceived QOL in airways disease | 1) Health Assessment Questionnaire Disability Index (HAQDI), Hand Mobility in scleroderma (HAMIS), Six Mminute walk test (6MWT) 2) Short Form 36 (SF-36 PCS, MCS)[Π] 3) Saint George's Respiratory Questionnaire (SGRQ), Lung function tests 4) Rodnan Skin thickness Score (RSS) | n=16 Median age [IGR] = 66.5 [63.0–70.5] | n=17 Median age [IGR] = 57 [50–67] No intervention | CG no significant differences over time. IG improvements of the Short Form 36 (PCS, MCS), of respiratory disease, of hand mobility over time. 1) HAQDI (median [IQR]): T0 0.63 [0.34–0.75], T2 0.56 [0.34–0.88], T4 0.44 [0.25–0.75], p=ns, HAMIS (median [IQR]): right hand T0 3.0 [2.5–4.5], T2 3.0 [2–4], T4 2.0 [0.5–2.5], T0-T2 p=ns, T2-T4 p=0.005, T0-T4 p=0.002, left hand T0 3.0 [2.5–4], T2 3.0 [1–3.5], T4 1.0 [0–3], T0-T2 p=ns ,T2-T4 p=0.008, T0-T4 p=0.003 2) SF-36 PCS (median [IQR]):T0 39.8 [33.9–42], T2 40.1 [35.6–43.5], T4 44.0 [41.5–48], T0-T2 p=ns, T2-T4 p=0.005, T0-T4 p=0.001, SF-36 MCS | Not reported in the article. |

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			4) Skin score			(median [IQR]): T0 46.5 [42.2–49.2], T2 46.3 [40.5–50.6], T4 50.4 [46–54.3], T0-T2 p=ns, T2-T4 p=0.004, T0-T4 p=0.013 3) SGRQ (median [IQR]): T0 30.9 [17.3–36.9], T2 29.2 [16.2–37.1], T4 22.7 [12.5–31.3], T0-T2 p=ns, T2-T4 p=0.016, T0-T4 p=0.012 4) data not shown, not significant	
Attia [4], 2014, single case study, USA	SSc ♀ IC n=1	Physiotherapy; 1) cervical dysfunction	1) Soft tissue mobility, posture, range of motion (ROM)	n=1 Age 71	n.a.	The patient was able to increase cervical ROM in left rotation to match that of the ipsilateral side, strength improved in all tested cervical and upper extremity planes, and soft tissue mobility improved. Soft tissue mobility: Scores are not reported Posture: "some progress", 25% of goal met ROM: 75% of goal met	Not reported in the article.
Austin, et al. [5]; 1996; RCT; USA	SLE ♀ IG n=27 ♂ IG n=1 ♀ CG n=26 ♂ CG n=1	Telephone intervention strategies; primary outcome was not specified, 1) Health outcomes (fatigue, physical dysfunction, psychological affect)	1) Fatigue Severity Scale (FSS), Arthritis Impact Measurement Scales 2 (AIMS2)	n=28 Mean age = 53.0 (±SD not reported) treatment counselling (TC)	n=27 Mean age = 49.6 (±SD not reported) symptom monitoring (SM); The SM and TC protocol was expected to assist patients in primary outcome	6-month follow-up, mean AIMS2 Physical Function scale significantly improved for the TC group compared to the SM groups. The mean FSS score, AIMS2 Affect score, and AIMS2 Pain score significantly improved for both groups. FSS (mean [±SD]): IG baseline (4.57 [±0.47]); 6 month (3.95 [±1.17]; ES 0.55; CG baseline (4.57 [±0.37]); 6 month (4.22 [±0.79]; ES 0.44; IG and CG baseline (4.57 [±0.42]); 6 month (4.08 [±1.00]; ES 0.50; within group p=0.001; between group p=0.319 AIMS2 Physical scale (mean [±SD]): IG baseline (3.91 [±1.99]); 6 month (3.12 [±2.17]; ES 0.42; within group p=0.003; CG baseline (3.40 [±1.71]); 6 month (3.77 [±2.07]; ES -0.34; within group p=0.036; IG and CG baseline (3.66 [±1.86]); 6 month (3.44 [±2.13]; ES 0.14; within group p=0.091; between group p=0.014 AIMS2 Affect scale (mean [±SD]): IG baseline (4.27 [±2.12]); 6 month (3.56 [±1.97]; ES 0.47; CG baseline (4.32 [±1.74]); 6 month (3.56 [±1.59]; ES 0.62; IG and CG baseline (4.30 [±1.92]); 6 month (3.56 [±1.78]; ES 0.54; within group p=0.000; between group p=0.923 AIMS2 Pain scale (mean [±SD]): IG baseline (4.95 [±2.80]); 6 month (4.44 [±2.59]; ES 0.21; CG baseline (6.22 [±2.55]); 6 month (5.48 [±1.90]; ES 0.44; IG and CG baseline (5.57 [±2.73]); 6 month (4.95 [±2.32]; ES 0.30; within group p=0.029; between group p=0.507	Physical function seemed to worsen in the SM group while it improved significantly in the TC group.
Avaux, et al. [6]; 2016; RCT; Belgium	SLE ♀ IG (HT) n=16 ♀ IG (ST) n=15 ♂ IG (HT) n=2	Supervised training (ST) compared to home training (HT); 1) Fatigue	1) Fatigue severity scale (FSS)	HT n=18 Mean age = 37 (±7) ST n=15 Mean age = 43 (±7)	n=9 Mean age = 46 (±11) No intervention	ST and HT, but not the CG, improved their FSS at month 3, compliance was similar and low (±50%) in both exercise groups. Moreover, less compliant patients improved their fatigue as much as more compliant patients. Detailed data are not shown in the article.	Not reported in the article.

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	♂ IG (ST) n=0 ♀ CG n=9 ♂ CG n=0						
Ball [7]; 2010; single case study; UK	SLE ♀ IG n=2	Fascial Release Therapy (FRT) and structural integration (SI); no primary outcome defined, 1) Reducing pain, stiffness, fatigue, anxiety. 2) Enhancing functional mobility, autonomy, quality of life, emotional state, autonomic and immune function.	1) and 2) Pain, on a 0-10 reported scale (NRS), functional mobility/ROM, functional autonomy, episodes of exhaustion, emotional state, Quality of life, only case 1: use of pain medication, only case 2: GI tract malfunction.	n=2 Age: 55 and 22 years	n.a.	**CASE 1:** pain decreased from 8.5 to 1.5; Use of pain medication was reduced from 9.2 to 1.9; Functional mobility/RoM rose from 2.0 to 8.1; RoM in specifically, unilaterally restricted joints, directions of movement, and/or body areas increased to at least 80-90% of the contralateral side, where RoM gains had likewise been achieved; Functional autonomy (daily, leisure, social activities) improved from 2.5 to 7.8; Episodes of exhaustion diminished from 9.3 to 3.5; Positive emotional state improved from 1.0 to 7.5; Quality of life recovered from 2.2 to 7.8. **CASE 2:** pain decreased from 8.0 to 2.0; GI tract malfunction regressed from 7.5 to 3.8; Functional mobility/RoM rose from 2.8 to 7.5; R trunk side-bending improved by 20% and spinal 'elevation' by over 2 cm after Session 1; bilateral ankle plantar/dorsiflexion increased by an estimated 20%+, as did 'true' hallux extension; L hip extension and lateral rotation attained over 90% of RoM on the R; Functional autonomy improved from 4.5 to 8.0; Episodes of exhaustion diminished from 9.1 to 4.0; Positive emotional state improved from 2.8 to 8.0; Quality of life recovered from 3.9 to 7.5 In addition, both had fascia-related improvements: Softness, pliability, extensibility, and mobility of the skin, subcutaneous, and superficial ('deep investing layer') fasciae; Softness and 'fluidity' of areolar fascia; Independent gliding between adjacent fasciae and structures; Muscle tone, resting length, softness, flexibility, proprioception, recruitment, and performance.	Not reported in the article.
Benatti, et al. [8]; 2014; RCT; Brazil	SLE ♀ IG n=16 ♀ CG n=17 ♀ healthy controls n=10	Exercise training program; 1) Lipid profile, composition of high-density lipoprotein (HDL) HDL2 and HDL3	1) Blood samples	n=16 Mean age = 31.3 (±5.9)	n=17 Mean age = 29.7 (±5.3) no intervention healthy controls (same training program as IG) n=10	IG: trend toward lower Apo B levels (p = 0.06, ES = −0.3, within-group comparison), no other significant changes in any of the variables CG: no changes in any variables (p > 0.05, within-group comparisons) Healthy controls: significantly (cholesterol p = 0.036, ES = 2.06; triglyceride p = 0.038, ES = 1.77; and HDL2p = 0.0021, ES = 2.37 within-group comparisons), Apo A-I not significance in the healthy control group (p = 0.17, ES = 1.10; within-group comparison between-group comparison), it was significantly higher than in the IG group (p = 0.02, ES = −1.5,)	No adverse events have occurred.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
					Mean age = 30.9 (±7.2)		
Berdal, et al.[9]; 2018; RCT; Norway	SLE IG = 2 CG = 13	Structured Goal Planning and Supportive Telephone Follow-up; 1) Health-related quality of life (HRQoL)	1) Patient Generated Index (range 0–100, where 0 = low)	n=2 Mean age not reported for SLE patients	n=13 Mean age not reported for SLE patients Usual care	In this study, patients with different diseases were investigated. Since no subgroup analyses were presented in the article, the effectiveness findings refer to a mixed population, which makes a conclusion related to people with SLE only impossible. Significant treatment effect of the add-on intervention on HRQoL was found on discharge (mean difference 3.32 [95% confidence interval 0.27, 6.37]; P = 0.03). No significant between-group differences were found after 6 or 12 months. Both groups showed positive changes in HRQoL following rehabilitation, which gradually declined, although the values remained at higher levels after 6 and 12 months compared with baseline values. 6 months: mean CG 48.4 (95% CI 45.9, 50.8); mean IG 50.3 (95% CI 47.8, 52.8); mean difference 1.91 (95% CI -1.19, 5.02), p=0.23 12 months: mean CG 49.3 (95% CI 46.8, 51.8); mean IG 48.8 (95% CI 46.2, 51.3); mean difference -0.58 (95% CI -3.75, 2.60), p=0.72	Not reported in the article.
Bogdanovic, et al.[10]; 2015; RCT; Serbia	SLE ♀ IG n=30 ♀ CG n=30	Different types of physical activity; 1) Quality of life	1) Questionnaire on quality of life Short Form 36 (SF-36)	n=30 aerobic training Mean age = 38.8 (±12.6)	n=30 isotonic exercises[①] Mean age = 47.9 (±11.5)	In all domains of quality of life, the questionnaire SF36 high statistical difference before and after physical activity both types (p < 0.001); results of comparison of physical activity on the bicycle ergometer and isotonic no significant difference. Other data regarding Quality of Life not shown.	Not reported in the article.
Boström, et al.[11]; 2016; RCT; Sweden	SLE ♀ IG n=18 ♀ CG n=17	physical activity programme; 1) Aerobic capacity	1) Maximal oxygen uptake (VO2max)	n=18 Mean age = 52 (±10)	n=17 Mean age = 53 (±9) Usual care	VO2 max. increased between baseline and month 3 (p<0.0001), between months 3 and 6 (p=0.01) and the increase was sustained at month 12, but not significant. 1) VO2 max. (l/min; displayed in estimated means and standard errors) (base IG 1.34 ±0.07; CG 1.41 ±0.07; month 3 IG 1.56 ±0.07; CG 1.54 ±0.08; month 6 IG 1.62 ±0.07, CG 1.65 ±0.08, month 12 IG 1.62 ±0.07, CG 1.63 ±0.08, Time p<0.0001, group p=0.95)	No adverse events have occurred.
Braden, et al.[12]; 1993; uncontrolled, longitudinal experimental study, USA	SLE ♀ IG n=299 ♂ IG n=14	Systemic Lupus Erythematosus Self-Help Course; primary outcome was not specified, 1) Psychosocial concerns, depression, enabling skill, rest,	1) Self-developed questionnaire	n=313 Mean age = 45.8 (±13.5)	n.a.	Depression and enabling skill had a significant mean change over time. Perception of limitation concerns was not significant. Limitation (mean ±SD): Time_1 2.3 (±0.7), Time_2 2.2 (±0.6), Time_3 2.2 (±0.6) Depression (mean ±SD): Time_1 176.1 (±98), Time_2 147 (±90.7), Time_3 2 154 (±96.7) Enabling skills (mean ±SD): Time_1 397.8 (±125.7), Time_2 419.7 (±113.3), Time_3 432.8 (±111.4)	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[+] Mean age (±SD)[ø]	n CG[+] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
		relaxation, heat and exercise activities					
Broadbent, et al. [13]; 2014; single case study; Australia	SSc ☿ IG n=1	Nintendo Wii Fit exercises; no primary outcomes defined 1) Functional capacity 2) Exercise tolerance 3) Strength 4) Balance	1) -4) 6-minute walk test (6MWT). Timed Up and Go (TUG). 30-second sit to stand. Hand grip strength. Tinetti Balance and Gait Assessment (TBGA). Falls Efficacy Scale–International (FES-I) questionnaire.	n=1 Age = 77	n.a.	Improvements in 6-minute walk test (6MWT) (100%); Timed Up and Go (TUG) (5.3%); 30-second sit to stand (25%); hand grip strength (right 21%; left 8.6%); ankle plantarflexion (right 16.7%; left 33.3%) and dorsiflexion (right 125%; left 88.9%), Tinetti Balance and Gait Assessment (balance score 35.5%; falls efficacy scale score 21.4%); resting systolic blood pressure (5.1%); and oxygen saturation (3.3%). The average movement of centre of pressure decreased post-intervention, but average velocity increased.	No adverse events occurred.
Brown [14]; 2010; expert-opinion; UK	SSc	Role of the nurse specialist in the management of digital ulcers; 1) Digital ulcera	n.a.	n.a.	n.a.	n.a.	n.a.
Brown, et al. [15]; 2012; RCT; USA	SLE ☿ IG (CBT) n=27 ☿ IG (EO) n=10 ☿ CG n=16	Cognitive behavioral therapy OR Education only; no primary outcome defined, 1) Manage pain 2) Disease adjustment and adaptation 3) Quality of life	1) McGill Pain Questionnaire – Short Form (SF-MPQ) 2) Behavior Assessment System for Children (BASC). 3) PedsQL	n=27 CBT Mean age = 15.4 (±3.0) n=10 EO Mean age = 15.0 (±3.3)	n=16 Mean age = 15.9 (±2.0) No intervention	Primary comparison was between the CBT group and the no-contact control group at the 7th week assessment. Results of the primary analysis of the GST that compared the CBT group and the no-contact control group at post-testing revealed that the CBT group did not exhibit significant overall improvement compared to the no-contact control group (T = −0.34, p = 0.63). CBT (n=27) vs. CG (n = 16), post-test t=−0.34; p=0.63	Not reported in the article.
Carrera, et al. [16]; Soriano-Maldonado, et al. [17]; 2019; quasi-experimental study; Spain	SLE ☿ IG n=26 ☿ CG n=32	12-week aerobic exercise intervention; 1) Arterial stiffness	1) Pulse wave velocity (PWV)	n=26 Mean age = 43.0 (±15.1)	n=32 Mean age = 44.8 (±13.1) Usual care	No between-group differences in the changes in arterial stiffness (median PWV difference -0.034, 95% CI -0.42 to 0.36 m/s; p = 0.860) at week 12.	No adverse events have occurred.
Carrier, et al. [18]; 2018; study protocol; Canada	SSc	Scleroderma patient-centered intervention network hand exercise program (SPIN-HAND); 1) hand functioning	1) 18-item Cochin Hand Function Scale (CHFS)	n.a.	n.a.	n.a.	n.a.
Carrier, et al. [19]; 2020;	SSc	Scleroderma Patient-Centered	1) Self-Efficacy for Managing Chronic Disease Scale score (SEMCD)	n.a.	n.a.	n.a.	n.a.

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study protocol; Canada		Intervention Network Self-Management Program (SPIN-SELF); 1) Self-efficacy					
Carvalho, et al. [20]; 2005; quasi-experimental study; Brazil	SLE ♀ IC n=41 ♀ CG n=19	supervised cardiovascular training; primary outcome was not specified, 1) Exercise tolerance 2) Aerobic capacity 3) Fatigue 4) Depression 5) Functional capacity 6) Quality of life	1) Maximum exercise tolerance in minutes 2) VO2max in ml/kg/minute 3) Fatigue severity scale (FSS) 4) Beck Depression Inventory questionnaire (BDI) 5) The Health Assessment Questionnaire (HAQ) 6) Short Form 36 (SF-36)	n=41 Mean age = 36.22 (±10.79)	n=19 Mean age = 35.21 (±9.13) No training.	IG significant improvement aerobic capacity measured by anaerobic threshold VO2 (14.67± 3.03 versus 17.08± 3.35 ml/kg/minute, P < 0.001). Comparison of the training group and control group after 12 weeks showed a significant difference relating to VO2max (24.31±4.61 versus 21.21±3.88 ml/kg/minute, P= 0.01) and anaerobic threshold VO2 (17.08±3.35 versus 13.66± 2.82 ml/kg/minute, P < 0.0001). After cardiovascular training, we found a significant improvement of Beck inventory score (8.37±12.79 versus 2.90±3.00, P < 0.001) and HAQ score (0.14±0.21 versus 0.06±0.19, P < 0.01) in the training group 1) Maximum exercise tolerance, mean (±SD): IG baseline 10.46 (±1.63), post-intervention 11.93 (±1.65), within p=0.001; CG baseline 10.91 (±1.64), post-intervention 11.11 (±1.51), within p=0.555 2) VO2max, mean (±SD): IG baseline 22.63 (±4.25), post-intervention 24.31 (±4.61), within p=0.02; CG baseline 22.40 (±4.69), post-intervention 21.21 (±3.88), within p=0.164 3) FSS, mean (±SD): IG baseline 3.57 (±1.47), post-intervention 2.68 (±1.33), within p=0.001; CG baseline 3.28 (±1.33), post-intervention 3.29 (±1.47), within p=0.97, between groups p=0.10 4) BDI, mean (±SD): IG baseline 8.37 (±12.79), post-intervention 2.90 (±3.00), within p=0.001; CG baseline 5.79 (±6.44), post-intervention 6.63 (±8.50), within p=0.89, between groups p=0.15 5) HAQ, mean (±SD): IG baseline 0.14 (±0.21), post-intervention 0.06 (±0.19), within p=0.01; CG baseline 0.23 (±0.27), post-intervention 0.38 (±1.14), within p=0.88, between groups p=0.03 6) SF-36 (general health status), mean (±SD): IG baseline 63.32 (±22.38), post-intervention 73.17 (±18.97), within p=0.001; CG baseline 63.47 (±22.76), post-intervention 62.37 (±26.08), within p=0.97, between groups p=0.14	Not reported in the article.
Clarke-Jenssen, et al. [21]; 2005; one-group pretest–post test design; Norway	SLE[£] ♀ IG n=6	Aerobic exercise program; primary outcome was not specified. 1) Pain and fatigue 2) Disease activity 3) Aerobic capacity 4) Physical function	1) Short Form Health Survey (SF-36) 2) Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) 3) Maximum oxygen uptake [VO2max] 4) Modified Health Assessment Questionnaire (MHAQ).	n=6 Mean age = 47[€]	n.a.	No aggravation in disease activity. Score differed significantly from baseline after exercise: 1) SF-36 physical function pre-post (p=0.03[α]), follow-up (p=0.03[α]) 2) VO2 after exercise pre-post (p=0.05[α]), follow-up (p=0.03[α]) No changes in the SF-36 pain score (p=0.1) and MHAQ score (p=0.08) after exercise compared with baseline.	Not reported in the article.

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Cunningham, et al. [22]; 2018; Cunningham, et al. [23]; 2019; qualitative study; USA	cSLE ⚲ IG n=14	Treatment and Education Approach for Childhood-onset Lupus (TEACH); primary outcome not specified; 1) Disease activity, 2) Fatigue, 3) Depression, 4) Anxiety, 5) Pain	1) Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) 2) Patient reported outcomes measurement information system (PROMIS) 3) Children's Depression Inventory 2nd Edition (CDI2); Beck Depression Inventory-II (BDI-II) 4) Screen for Child Anxiety Related Disorders (SCARED) 5) Numerical Rating Scale (NRS)	n=14 Mean age = 16.21 (±2.1)	n.a.	Statistically significant reduction in fatigue (Z = − 2.81, p=0.005) and depressive symptoms (Z = − 2.69, p=0.007). Not significant reductions in pain (Z = − 1.91, p=0.06) and anxiety (Z = − 1.95, p=0.05).	Not reported in the article.
Daltroy, et al. [24]; 1995; RCT; USA	SLE IG n=16[Ω] CG n=18	Exercise prescription and unsupervised home exercise programme; primary outcome was not specified, 1) Exercise tolerance 2) Fatigue 3) Depression 4) Helplessness	1) Graded exercise test (ETT) 2) MAC Fatigue Scale, POMS Fatigue Scale 3) National Institute of Health CES-D Depression Scale 4) Arthritis Helplessness Index	n=16	n=18 No intervention.	Analysis included RA also – no differentiation only for SLE possible (data pooled). Exercise group did better than controls on all outcomes— exercise tolerance, fatigue, depression and helplessness. However, none of the differences achieved statistical significance at the p=0.01 level, and a multivariate test for overall intervention effect was not significant (p= 0.34). ETT (min) (mean, SD not reported): IG 9.6, CG 9.2, p=0.33 MAC (mean, SD not reported): IG 16.5, CG 18.9, p=0.10 POMS (mean, SD not reported): IG 7.6, CG 10.3, p=0.03 CES-D (mean, SD not reported): IG 11.3, CG 15.0, p=0.07 Helplessness Index (mean, SD not reported): IG 30.0, CG 31.9, p=0.11	Not reported in the article.
Dobkin, et al. [25]; 2002; RCT; Canada	SLE ⚲ IG n=64 ⚲ CG n=69	Brief Supportive-Expressive Group Psychotherapy; primary outcome was not specified, reducing 1) Psychological distress 2) Medical symptoms 3) Health care costs 4) Improving quality of life	1) Symptom Checklist 90–Revised (SCL–90–R) 2) Systemic Lupus Activity Measure–Revised (SLAM–R) 3) Stanford Health Assessment Questionnaire (HAQ) 4) Short Form–36 (SF–36)	n=64 Mean age = 42.0 (±11.2)	n=69 Mean age = 43.0 (±10.4) Usual care	Intention-to-treat analyses revealed that there were no clinically important group differences on any of the outcome measures. 1) (Time 3 – Time 1) the coefficient for group was 0.01, with 95% CI = 0.13, 0.11, high distress was predicted by more distress at initial assessment, as well as increases in emotion oriented coping and stress but not by treatment group. 2) Within-subject changes indicated that 50.8% improved, 40.32% got worse, and 8.8% did not change over the 15-month period (−0.38, 95% CI 1.78-1.03). 3) No clinically meaningful between-group differences. 4) The group variable did not predict either health status dimension, indicating that the psychosocial intervention did not influence physical or mental health status at 12 months post treatment.	Not reported in the article.
Doerfler, et al. [26]; 2017; one-group pretest–posttest design; USA	SSc ⚲ IG n=16 ♂ IG n=2	Medical nutrition therapy (MNT) intervention; primary outcome was not specified (associated Effects).	1) Weight, height, and waist circumference (WC); dual-energy x-ray absorptiometry (DXA); Appendicular lean height (ALH) 2) 3-question (3Q) assessment tool 3) UCLA Scleroderma Clinical Trial Consortium Gastrointestinal Tracker 2.0	n=18 Mean age = 51 (±11)	n.a.	1) Significant decreases nutrition symptom scores (pre [12.8]; post [7.6]; p < .05); improvements in ALH (pre [5.6 ± 0.8]; post [5.8 ± 0.8]; p = 0.05); Sarcopenia (pre [n=7, 54%]; post [5, 39%]; p = 0.02); n.s.[¥] weight (pre [53.5 ± 9.2]; post [53.6 ± 9.0]; p=0.35), waist circumference (pre [76.2 ± 9.9]; post [75.2 ± 9.8]; p=0.84) 2) Physical activity (pre [2.4 ± 2.1]; post [2.5 ± 2.6]; p=0.56)	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
		1) Body composition 2) Physical activity, 3) GI symptoms 4) Health related quality of life	4) The Centres for Disease Control and Prevention (CDC) Health-Related QOL 4 (HRQOL-4)			3) UCLA SCGI score (pre [0.87 ± 0.44]; post [0.66 ± 0.49]; p=0. 20) 4) Health related quality of life (pre [7.7 ± 6.6]; post [6.6 ± 6.5]; p=0.34)	
Drenkard, et al. [27]; 2020; survey; USA	SLE ♀ IG n=168	Chronic Disease Self-Management Program (CDSMP); primary outcome not specified; 1) Quality of life 2) Self-Management 3) Disease severity	1) PROMIS (Patient-Reported Outcome Measurement Information System Short Form) 2) PROMIS (Patient-Reported Outcome Measurement Information System Short Form); PAM (Patient Activation Measure); Stanford Scale 3) SA-BILD (Self-Administered Brief Index of Lupus Damage); SLAQ (Systemic Lupus Activity Questionnaire)	n=168 Mean age = 47.3 (±14.0)	n.a.	Not applicable. Study focussed barriers to recruitment and retention to this program.	Not reported in the article.
Drenkard, et al. [28]; 2012; one-group pretest–posttest design; USA	SLE ♀ IG n=49	Chronic Disease Self-Management Program (CDSMP); primary outcome was not specified, 1) Health status 2) Self-efficacy 3) Self-management	1) SF-36 v2 Health Survey (MCS, PCS)[ΤΤ], Centre for Epidemiologic Studies Depression Scale (CES-D) 2) Self-efficacy for Managing Chronic Disease Scale 3) Cognitive Symptom Management Scale, Exercise Behaviors Scale, Communication with Physicians Scale, Self-reported Medication-taking Scale	n=49 Mean age = 43.8[€]; Median age (IQR) 44.7 (34.9–52.3)	n.a.	Significant improvements in the SF-36 physical; self-efficacy, cognitive symptoms management, communication with physicians and treatment adherence. 1) PCS (mean ±SD: pre [32.2 ±8.6]; post [34.6 ±9.6], p=0.032), MCS (mean ±SD: pre [42.7 ±14.0]; post [45.3 ±14.1], p=0.10), CES-D (mean ±SD: pre [21.0 ±15.0]; post [19.8 ±13.7], p=0.44) 2) Self-efficacy managing chronic disease (mean ±SD: pre [5.5 ±2.5]; post [6.0 ±2.3], p=0.035) 3) Cognitive symptom management (mean ±SD: pre [2.3 ±1.0]; post [2.6 ±0.9], p=0.036), Stretching/strengthening exercised (mean ±SD: pre [47.0 ±70.0]; post [45.4 ±60.3], p=0.88), Aerobic exercised (mean ±SD: pre [84.5 ±116.5]; post [79.1 ±81.3], p=0.72), Communication with physicians (mean ±SD: pre [2.8 ±1.1]; post [3.2 ±1.3], p=0.011), Medication-Taking Measures (mean ±SD: pre [2.2 ±1.4]; post [2.6 ±1.3], p=0.012)	Not reported in the article.
Edworthy, et al. [29]; 2003; RCT; Canada	SLE ♀ IG n=58 ♀ CG n=66	Brief supportive-expressive group psychotherapy; 1) Reduce illness-induced interference with valued activities and interests	1) Illness Intrusiveness Ratings Scale (IIRS): 3 life domains: (1) Relationships and personal development (family relationships, other social relationships, self-expression), (2) Intimacy (relationship with spouse, sex life), and/or (3) Instrumental life (work, finances, active recreation).	n=58 Mean age = 42.0 (±11.2)	n=66 Mean age = 43.0 (±10.4)) usual care	IIRS was measured pre-treatment, post treatment, 6 month follow-up, and 12 month follow-up. Significant reductions in illness intrusiveness for 2 of 3 domains: (1) relationships and personal development and (2) Intimacy. Benefits were evident at 6 and 12 month follow-ups; supportive-expressive group psychotherapy greater reductions in illness intrusiveness, overall (F = 5.282; p = 0.012), and this was accounted for primarily by the IIRS Intimacy (F = 5.057; p = 0.013) and Relationships and Personal Development subscales (F = 2.34; p = 0.065). Instrumental activities related to health,	Not reported in the article.

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						work, and finances were not significantly affected by the intervention. No more details reported.	
Everett, et al. [30]; 2015; quasi-experimental study; USA	SLE IG n=41 IG n=30[Ω] ^Ω ⚢ n=63 ^Ω ♂ n=8 Mean age[∀]= 39.7 (±12.82)	patient-centered nutrition counselling; no primary outcome defined, 1) Select nutrient 2) Anthropometric outcomes 3) Clinical outcomes	six-month changes in 1) Nutrient intake 2) Weight, body mass index (BMI), waist circumference 3) Lipid levels	n=41	n=30 Non attenders	(1) IG reduced their intake of sodium (p=0.006), total calories (p=0.07), and percent calories from fat (p=0.011) and saturated fat (p=0.068), were more likely to report increases in eating a diet rich in fruits and vegetables (p<0.001), a high fiber diet (p=0.011), equal or more than two servings of fish/week (p=0.002), and a low cholesterol diet (p=0.034) (2) Had decreased weight (-1.64 kg, p=0.025), no changes in BMI and clinical outcomes

Between groups: at six months IG followed a high-fiber diet (p=0.03), consumed two or more servings of fish per week (p=0.01), followed a low-cholesterol diet (p=0.03), and achieved a greater weight loss (p=0.04)

Calories (kcals), mean (SD): baseline 1687.64 (±515.59); six-month 1522.91 (±440.78); difference 164.73 (±568.71); p=0.071 %Calories from fat: baseline 32.93 (±8.71); six-month 28.18 (±8.24); difference 4.13 (±9.88); p=0.011 %Calories from saturated fat: baseline 10.37 (±4.19); six-month 9.22 (±3.32); difference 1.15 (±3.91); p=0.068 Cholesterol (grams), mean (SD): baseline 277.71 (±204.23); six-month 231.38 (±149.74); difference 46.34 (±225.32); p=0.195 Sodium (grams), mean (SD): baseline 2518.28 (±883.53); six-month 2009.94 (±977.74); difference 508.34 (±1359.82); p=0.006 Omega-6 fatty acids (grams), mean (SD): baseline 9.02 (±4.97); six-month 8.53 (±8.24); difference 0.49 (±6.78); p=0.647 Omega-3 fatty acids (grams), mean (SD): baseline 0.33 (±0.66); six-month 0.29 (±0.43); difference 0.04 (±0.81); p=0.739 Fiber (grams), mean (SD): baseline 18.04 (±8.62); six-month 18.38 (±9.33); difference 0.34 (±9.33); p=0.823 Sugar (grams), mean (SD): baseline 82.52 (±53.17); six-month 76.72 (±38.93); difference 5.80 (±51.93); p=0.479 Folate (mg), mean (SD): baseline 365.16 (±193.66); six-month 334.89 (±211.13); difference 30.27 (±261.11); p=0.462 | Not reported in the article. |
| Filippetti, et al. [31]; 2020; RCT; Italy | SSc[Ω] IG n=22 CG n=22 | Home-based minimally supervised exercise program; | 1) 6 minutes walking test (6MWD) | n=22 Mean age = 63.6 (±10.4) | n=22 Mean age = 61.8 (±14.4) | At 6 months, the distance walked in 6 minutes increased by 46m (baseline 486, 95% CI 458-513m; 6 months 532, 95% CI 504-561m) in IG, whereas it decreased by 5m (baseline 464, 95% CI 431-497m; 6 | Patients were asked about their side effects to the |

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
		primary outcome not specified; 1) Functional capacity			Usual care	months 459, 95% CI 427-490m) in CG; significantly different between-groups comparison (P < .001). 6MWD (m) IG baseline 486 (CI95% 458;513); 3 months 518 (CI95% 492;544); 6 months 532 (CI95% 504;561);CG: baseline 464 (CI95% 431;497); 3 months 461 (CI95% 432;489); 6 months 459 (CI95% 427;490); between groups p<.0001	exercise program. More is not reported.
Freedman, et al. [32]; 1984; RCT; USA	SSc ♀ n=22 ♂ n=2	1) Autogenic training; 2) Finger temperature biofeedback, 3) frontalis EMG biofeedback; 1) Microcirculation	1) Finger-temperature: Distal end of the middle finger of the dominant hand using a Yellow Springs No. 729 thermistor and a Thermivolt bridge circuit.	Groups are not reported. Age not reported.	Groups are not reported. Age not reported.	Finger temperatures from the post-training voluntary control session showed significant effects for Minutes [F (15,315) = 3.15, P< 0.0001] and Groups x Minutes [F(30,315) = 1.65, P< 0.05]. The temperature feedback group again showed a significant (P < 0.05) increase in finger temperature between min 17 and min 32, while the other two groups did not. More detailed data are not presented.	Not reported in the article.
Greco [33]; 2015; study protocol, USA	SLE	Mind-Body Skills Training 1) Mental health	1) Centre for Epidemiologic Studies Depression scale (CES-D)	n.a	n.a	n.a	n.a
Greco, et al. [34]; 2004; RCT; USA	SLE ♀ IG BF/CBT n=30 ♂ IG BF/CBT n=2 ♀ IG SMS n=32 ♂ IG SMS n=1 ♀ CG n=25 ♂ CG n=2	Stress-reduction program: BF /CBT (biofeedback/cognitive bahavioural therapy); primary outcome was not specified, 1) Pain 2) Psychological function 3) Physical function	1) The Revised Arthritis Impact Measurement Scales, pain subscale (AIMS2-Pain), The pain interference scale of the Multidimensional Pain Inventory (MPI-I) 2) The Center for Epidemiological Studies Depression scale (CES-D), Arthritis Self-Efficacy Scales, pain and other symptoms Subscale (ASES), Cohen's Perceived Stress Scale (STRESS) 3) Short Form 36 Health Survey (SF-36), the physical function scale of the SF-36 (SF-36-PF), the Fatigue Severity Scale (FSS), VAS (patients global)	BF/CBT n=32 Mean age = 48.2 (±9.1)	SMS n=33 Mean age = 46.7 (±11.7) symptom-monitoring support UC n=27 Mean age = 47.0 (±10.5) usual medical care	BF/CBT significant reductions in pain and psychological dysfunction compared with SMS (pain, p=0.044; psychological functioning, p<0.001) and UC (pain, P=0.028; psychological functioning, p<0.001). BF/CBT significant improvement physical function compared UC (p=0.035), at 9-month (FU) follow up BF/CBT benefit compared with UC psychological functioning (p=0.023). 1) AIMS2-Pain (ES△) (BF/CBT pre-post 0.74, pre-FU 0.63; SMS pre-post 0.37, pre-FU 0.47; UC pre-post 0.36, pre-FU 0.27); MPI-I (ES) (BF/CBT pre-post 0.72, pre-FU 0.59; SMS pre-post 0.25, pre-FU 0.35; UC pre-post 0.19, pre-FU 0.19); pre-post BF/CBT > UC p=0.028; pre-post BF/CBT > SMS p=0.044; pre–FU BF/CBT > UC p=0.305; pre–FU BF/CBT > SMS p=0.718 2) CES-D (ES) (BF/CBT pre-post 0.50, pre-FU 0.48; SMS pre-post 0.11, pre-FU 0.32; UC pre-post -0.10, pre-FU 0.18); ASES (ES△) (BF/CBT pre-post 1.05, pre-FU 0.68; SMS pre-post 0.03, pre-FU 0.10; UC pre-post -0.17, pre-FU -0.08); STRESS (ES△) (BF/CBT pre-post 0.49, pre-FU 0.41; SMS pre-post -0.06, pre-FU 0.32; UC pre-post -0.18, pre-FU -0.07); pre-post BF/CBT > UC p<0.001; pre-post BF/CBT > SMS p=0.001; pre–FU BF/CBT > UC p=0.023; pre–FU BF/CBT > SMS p=0.215 3) SF-36-PF (ES) (BF/CBT pre-post 0.42, pre-FU 0.33; SMS pre-post 0.03, pre-FU 0.07; UC pre-post 0.11, pre-FU -0.05); FSS (ES) (BF/CBT pre-post 0.36, pre-FU 0.15; SMS pre-post 0.28, pre-FU 0.31; UC pre-post 0.09, pre-FU 0.13); VAS (ES) (BF/CBT pre-post 0.61, pre-FU 0.60; SMS pre-post 0.07, pre-FU 0.24; UC pre-post -0.23, pre-FU 0.14); pre-post	Not reported in the article.

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						BF/CBT > UC p=0.035; pre-post BF/CBT > SMS p=0.097; pre–FU BF/CBT > UC p=0.125; pre–FU BF/CBT > SMS p=0.227	
Gregory, et al. [35]; 2019; RCT; UK	SSc ♀ IG n=12 ♂ IG n=7 ♀ CG n=13 ♂ CG n=4	Daily hand exercises with daily home wax bath hand treatment; 1) Function (hand)	1) Hand Mobility in Scleroderma test (HAMIS)	n=19 Median age = 64.4 (IQR 53.3 to 67.3)	n=17 Median age = 66.4 (IQR 56.3 to 71.7) Daily hand exercises without wax bath	Between group comparisons showed no significant difference; experimental-control -1.47 (-3.55 to 0.61), P=0.16) or at 18-week follow up experimental-control 1.94 (-1.07 to 4.95), P=0.20).	Not reported
Harrison, et al. [36]; 2005; one-group pretest–posttest design; USA	SLE ♀ IG n=17	MINDFUL (Mastering the Intellectual Navigation of Daily Functioning and Undoing the Limitations of Lupus); 1) Cognitive dysfunction	1) The Metamemory in Adulthood Questionnaire (MIA). The Memory Functioning Questionnaire (MFQ)	n=17 Mean age = 46.07 (±10.0)	n.a.	Changes in MIA scores were recorded for overall metamemory (p< 0.001), capacity (p = 0.004), change in memory (p< 0.001), strategy (p=0.047), and locus of control (p= 0.004) immediately after MINDFULL. Changes in memory functioning were also recorded for the kinds of memory problems (p=0.003), mnemonic usage (p=0.032), and retrospective functioning (p=0.020). No changes were noted in frequency or seriousness of forgetting. MIA, mean (SD): Total score pre 3.42 (0.14), post 3.65 (0.20), p=0.00003 MFQ, mean (SD): Kinds of memory problems pre 2.88 (0.96), post 3.94 (0.85), p=0.003 MFQ, mean (SD): Frequency of forgetting pre 4.16 (0.58), post 4.47 (0.81), p=0.123 MFQ, mean (SD): Seriousness of forgetting pre 2.98 (0.68), post 3.10 (0.85), p=0.649 MFQ, mean (SD): Mnemonic usage pre 2.30 (0.88), post 1.84 (0.59), p=0.032 MFQ, mean (SD): Retrospective functioning pre 2.29 (0.97), post 3.08 (1.29), p=0.020	Not reported in the article.
Haupt, et al. [37]; 2005; quasi-experimental study; Germany	SLE ♀ IG n=24 ♂ IG n=2 ♀ CG n=7 ♂ CG n=1	Psychological intervention; 1) Improving coping	1) Freiburg questionnaire on coping with illness (FKV), self-acceptance registration scale (SESA), the hospital anxiety and depression scale–German version (HADS-D), symptom checklist 90 revised version (SCL-90-R)	n=26 Mean age = 40.15 (±12.96)	n=8 Mean age = 47.63 (±11.19) No intervention	34 SLE patients (91% female, mean age 42 years) improved significantly over a 6 month period on most of the psychological measuring instruments (within group) SCL-90-R (mean (SD), only Global values presented here): Overall mental burden (GSI) baseline 59.74 (7.45); 3 month 56.15 (6.77, p<0.01), 6 month 55.59 (7.44, p<0.001), 12 month 55.41 (9.54, p<0.01) HADS-D Anxiety, mean (SD): baseline 7.18 (3.72); 3 month 6.09 (3.05, p=ns), 6 month 5.53 (3.47, p<0.01), 12 month 5.71 (4.06, p<0.05) HADS-D Depression, mean (SD): baseline 7.26 (4.60); 3 month 5.97 (3.95, p<0.01), 6 month 5.38 (3.67, p<0.01), 12 month 5.41 (3.99, p<0.01)	Not reported in the article.

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						FKV Depressive coping, mean (SD): baseline 2.45 (.77); 3 month 2.24 (.71, p<0.05), 6 month 2.14 (.80, p<0.05), 12 month 2.05 (.65, p<0.01) FKV Active problem oriented, mean (SD): baseline coping 3.41 (.73); 3 month 3.40 (.83, p=ns), 6 month 3.45 (.85, p=ns), 12 month 3.46 (.72, p=ns) FKV Distraction/self-encouragement, mean (SD): baseline 3.23 (.98); 3 month 3.26 (.72, p=ns), 6 month 3.35 (.63, p=ns), 12 month 3.24 (.65, p=ns) FKV Religiousness/search for meaning, mean (SD): baseline 2.86 (.79); 3 month 2.85 (.83, p=ns), 6 month 2.92 (.87, p=ns), 12 month 2.88 (.92, p=ns) FKV Playing down/wishful thinking, mean (SD): baseline 2.61 (.98); 3 month 2.40 (1.01, p=ns), 6 month 2.25 (.88, p<0.05), 12 month 2.22 (.88, p<0.001) SESA Self-acceptance, mean (SD): baseline 108.74 (20.06); 3 month 111.00 (19.05, p=ns), 6 month 113.06 (19.26, p<0.05), 12 month 115.91 (18.03, p<0.01)	
Herschman, et al. [38]; 2014; developmental study; Canada	SLE	mobile app for adolescents to improve 1) Autonomy 2) Enabling symptom tracking 3) Facilitating communication with care providers and peers	n.a.	n.a.	n.a.	Report describes the development of a mobile (smartphone) app for adolescents with lupus	n.a.
Horton, et al. [39]; 1997; survey; USA	SLE ♀ IG n=145 ♂ IG n=8	Lupus Line (telephone peer counselling service); 1) Intervention aimed to support people with SLE emotionally (in this case the satisfaction with the program was evaluated)	1) Self-developed questionnaire	n=153 Mean age Between 30 and 49 years (64.5%).	n.a.	High levels of satisfaction with 92% reporting at least moderate satisfaction with the service; 60% of respondents who reported a change in 6 "feeling" categories attributed this change to using Lupus Line. Fewer users reported a change in 4 specific behaviors since using the service, but more respondents attributed changes, when they occurred, to Lupus Line.	Not reported in the article.
Horváth, et al. [40]; 2017; quasi-experimental	SSc ♀ IG n=29 ♂ IG n=2	hand physical therapy; 1) Hand function	1) Health Assessment Questionnaire (HAQ), Disabilities of the Arm, Shoulder and Hand (DASH)	n=31 Mean age = 59.7 (±14.5)	n=22 Mean age = 62.1 (±8.4)	6 months IG improvement in HAQ and DASH scores compared to the baseline values (p<0.05). The improvement in median HAQ value (25%-75% quartiles) reached the clinical meaningful rate (baseline 1.125 /0.625-1.625/ versus 0.75 /0.25-1.5/ at six months). However,	No adverse events have occurred.

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study; Hungary	♀ CG n=11 ♂ CG n=11				Similar therapy for their large joints	comparing the results between the patients and the control groups, there were no significant difference in the values of the functional tests, both at baseline and at six-month follow-up. IG: HAQ (median [IQR]): T0 (Baseline 1.125 [0.6-1.6]); T1 (3 weeks 0.937 [0.5-1.5]); T2 (6 months 0.75 [0.25-1.5]); T0-T1 p=0.042; T0-T2 p=0.017; DASH (median [IQR]): T0 (Baseline 34.2 [18.3-55.0]); T1 (3 weeks 29.3 [12.9-49.1]); T2 (Six months 32.5 [10.0-45.8]); T0-T1 p=0.001; T0-T2 p=0.023 CG: HAQ (median [IQR]): T0 (Baseline 0.875 [0.4-1.2]); T1 (3 weeks 1.18 [0.7-1.5]); T2 (6 months 0.875 [0.4-1.4]); T0-T1 p=0.378; T0-T2 p=0.442; DASH (median [IQR]): T0 (Baseline 37.5 [26.5-46.7]); T1 (3 weeks 38.7 [20.2-49.3]); T2 (6 months 37.8 [18.6-52.9]); T0-T1 p=0.007; T0-T2 p=0.948 Between groups (change in mean [95%CI]): HAQ-DI: IG -0.206 [-0.37 to -0.04]; CG 0.007 [-0.36 to 0.38]; p=0.217; DASH: IG -5.2[-9.3 to -1.1]; CG -2.29 [-8.5 to 4.0]; p=0.414	
Kankaya and Karadakovan [41]; 2020; RCT; Turkey	SLE ♀ IG n=38 ♂ IG n=2 ♀ CG n=38 ♂ CG n=2	Web-based education and counselling; no primary outcome; 1) Self-efficacy 2) Fatigue 3) Care satisfaction	1) Self-Efficacy for Managing Chronic Disease 6-Item Scale 2) Fatigue Severity Scale (FSS) 3) Patient Assessment of Chronic Illness Care (PACIC)	n=40 Mean age = 35.58 (±8.40)	n=40 Mean age = 39.00 (±12.71) Usual care	Significant improvement in fatigue, self-efficacy and assessment of chronic illness care in the experimental group at the end of the study (p<0.05). 1) Post-intervention (month 6): IG 5.17 (1.87); CG 4.29 (2.15); p=0.04 2) Post-intervention (month 6): IG 3.88 (1.25); CG 5.03 (1.43); p=0.001 3) Post-intervention (month 6): IG 2.59 (0.33); CG 1.99 (0.34); p=0.000	Not reported
Karlson, et al. [42]; 2004; RCT; USA	SLE ♀ IG n=63 ♂ IG n=1 ♀ CG n=56 ♂ CG n=2	Psychoeducational intervention; 1) Patient self-efficacy and partner support	1) Medical Outcomes Study Short Form 36 (SF-36) questionnaire	n=64 Mean age = 42.7 (±22.8)	n=58 Mean age = 40.8 (±11.1) Attention intervention	Global mental health status at 12 months, as measured by the Short Form 36 survey, was 69 points in the experimental group compared with 58 points in the control group (p=0.04). SF-36, global mental health (base: IG [61±23]; CG [61±23]; p=1.0; T6: IG [61±25]; CG [61±25]; p=1.0; T12: IG [69±26]; CG [58±23]; p=0.04) SF-36, global physical function (base: IG [48±24]; CG [49±25]; p=0.9; T6: IG [52±26]; CG [47±24]; p=0.4; T12: IG [55±25]; CG [48±25]; p=0.2)	Not reported in the article.
Keramiotou, et al. [43]; 2020; RCT; Greece	SLE ♀ IG n=31 ♂ IG n=1 ♀ CG n=27 ♂ CG n=3	Individually tailored 30-min daily upper-limb exercise programme; 1) Function	1) Disabilities of Arm, Shoulder and Hand (DASH)	n=32 Mean age = 43.34 (±8.90)	n=30 Mean age = 48.77 (±12.38) Usual care	There was statistically significant difference between the comparison groups (exercise vs control) in relation to percentage change of DASH variable from baseline to 6 weeks (−33.72% vs −1.25%, p<0.001), 12 weeks (−43.41% vs −11.23%, p<0.001) and 24 weeks (−51.86% vs −7.10%, p<0.001). DASH: Exercise group: baseline 39.02 (16.10); 6 weeks 27.82 (14.18), 12 weeks 21.49 (16.19), 24 weeks 19.09 (14.52); Control group: baseline 43.08 (16.39); 6 weeks 43.45 (19.36), 12 weeks 38.38 (16.29), 24 weeks 38.85 (18.90)	No adverse events have occurred.

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Khanna [44]; 2019; study protocol, USA	SSc	Internet-based self-management program 1) Enhancing self-management	1) Managing Symptoms Scale on the PROMIS® Self-efficacy Short Form 8	n.a	n.a	n.a	n.a
Khanna, et al. [45]; 2020; RCT; USA	SSc ♀ IG n=123 ♂ IG n=11 ♀ CG n=120 ♂ CG n=13	Internet-Based Self-Management Program; 1) Self-efficacy	1) PROMIS Self-Efficacy for Managing Chronic Conditions instrument	n=134 Mean age = 54.3 (±10.1)	n=133 Mean age = 52.9 (±13.1) Usual care	No statistical differences between the 2 groups for the primary outcome (Patient-Reported Outcomes Measurement Information System Self-Efficacy for Managing Symptoms: mean change of 0.35 in the internet group versus 0.94 in the control group; P = 0.47). PROMIS self-efficacy; Managing symptoms: baseline: IG 47.41 (±9.15), CG 47.58 (±7.81), p=0.87; 16 weeks follow up: IG 47.53 (±8.50), CG 48.61 (±8.70). p=0.32; changes: IG 0.35 (±6.12), CG 0.94 (±6.79), p=0.47	Not reported
Kristensen, et al. [46]; 2019; RCT; Denmark	SSc ♀ IG n=36 ♂ IG n=7 ♀ CG n=27 ♂ CG n=16	Paraffin prior to hand exercises; 1) Function (hand)	1) Hand Mobility in Scleroderma (HAMIS)	n=43 Mean age = 57.8 (±11.0)	n=43 Mean age = 60.4 (±10.5) lukewarm water prior to hand exercises	No statistically significant differences, within both groups, hand mobility improved on the HAMIS 6 months post baseline with -2.6 points (95% CI: -4.4; -0.8) in the paraffin group and -3.3 points (95% CI: -5.2; -1.5) in the water group. Improvements were maintained at 12-month follow-up. Significant improvements within groups at 6 and 12 months for both groups. HAMIS 3 months: IG -0.4 (-2.2;1.5); CG -1.8 (-3.6;–0.1); difference between groups -0.6 (-4.3;3.0); p=0.7 6 months: IG -2.6 (-4.4;–0.8); CG 28 -3.3 (-5.2;–1.5); difference between groups 28 -1.3 (-4.7;2.1); p=0.5 12 months: IG -3.0 (-4.8;–1.2); CG 28 -2.9 (-4.6;–1.1); difference between groups 28 -2.1 (-5.5;1.3); p=0.2	No adverse events have occurred.
Kusnanto, et al. [47]; 2018; one-group pretest–posttest design; Indonesia	SLE ♀ IG n=36	Orem's self-care model; primary outcome was not specified, 1) Self-care agency (SCA) 2) Self-care operation 3) Quality of life (QoL)	1) Exercise of Self-Care Agency Scale 2) Self-Rated Abilities for Health Practices Scale 3) LupusPRO	n=36 Age range=19-44 years	n.a.	Exercise of Self-Care Agency Scale: increased by an average of 19.93% (p < 0.001) Self-Rated Abilities for Health Practices Scale: increased by an average of 17.53% (p < 0.001) LupusPRO: increase by an average of 12.19% (p < 0.001)	Not reported in the article.
Kwakkenbos, et al. [48], 2014, single case study, The Netherlands	SSc ♀ IG n=1	Cognitive-Behavioural Therapy; 1) Reduce emotional distress 2) Reduce concerns about the future	1) Not defined 2) Not defined Measures used in the study: - Depression (CES-D) - Fear of progression (FoP-Q-SF) - Anxiety (STAI short form) - Fear of negative evaluation (FNE)	n=1 Age = 53	n.a.	Depression (CES-D) baseline: 27; post-treatment (change %): 24 (-11.1%): Follow-up (change %): 21 (-22.2%) Fear of progression (FoP-Q-SF) baseline: 34; post-treatment (change %): 27 (-20.6 %): Follow-up (change %): 27 (-20.6 %) Anxiety (STAI short form) baseline: 29; post-treatment (change %): 26 (-10.3 %): Follow-up (change %): 24 (-17.2 %)	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[+] Mean age (±SD)[ø]	n CG[+] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
						Fear of negative evaluation (FNE) baseline: 56; post-treatment (change %): 46 (-17.8 %): Follow-up (change %): 52 (-7.1 %)	
Kwakkenbos, et al. [49]; 2011; one-group pretest–posttest design; The Netherlands	SSc ♀ IG n=34 ♂ IG n=7	Group-based psycho-educational programme; primary outcome was not specified, 1) Disease related cognitions 2) Depressed mood 3) Physical functioning	1) Illness Cognitions Questionnaire (ICQ) and Acceptance Limitations Scale (ALS) 2) Depressed Mood subscale of the Impact of Rheumatic Diseases on General Health and Lifestyle (IRGL) 3) Scleroderma Health Assessment Questionnaire (SHAQ)	n=41 Mean age = 52.8 (±12.2)	n.a.	Patients reported less helplessness after the intervention, and higher acceptance of their limitations. However, no difference in depressed mood and physical functioning was observed. Acceptance (ICQa), mean(±SD), [95% CI]): pre 15.7 (±3.8), diff pre-post 0.53 [-0.43, 1.49], ES 0.13, diff pre-post 0.75 [-0.14, 1.65], ES 0.21, p=0.13 Helplessness (ICQa), mean(±SD), [95% CI]): pre 13.1 (±4.2), diff pre-post -1.24 [-2.27, -0.22], ES -0.32, diff pre-post -1.05 [-2.03, -0.08], ES -0.26, p=0.02 Acceptance of limitations (ALSb), mean(±SD), [95% CI]): pre 29.0 (±4.9), diff pre-post -1.60 [-3.22, 0.02], ES -0.28, diff pre-post -2.24 [-3.73, -0.75], ES -0.44, p=0.01 Depressive mood (IRGLc), mean(±SD), [95% CI]): pre 4.2 (±4.6), diff pre-post 0.13 [-1.07, 1.32], ES 0.02, diff pre-post -.05 [-1.47, 1.37], ES -0.02, p=0.48 Physical functioning (HAQ-DId), mean(±SD), [95% CI]): pre 0.89 (±0.6), diff pre-post 0.03 [- 0.07, 0.14], ES -0.06, diff pre-post -.05 [-0.06, 17], ES -0.09, p=0.52	Not reported in the article.
Landim, et al. [50]; 2019; one-group pretest–posttest design; Brazil	SSc ♀ IG n=19 ♂ IG n=3	Home-based self-management program (Hands on-a hand care guide in SSc); no primary outcome specified; 1) Hand pain 2) Hand function	1) Visual Analogue Scale (VAS) 2) Cochin Hand Function Scale (CHFS)	n=22 Mean age = 48.09 (±11.67)	n.a.	Significant improvements for hand pain (3.97 vs 2.21, ES: 0.69) and Cochin Hand Function Scale (19.24 vs 12.48, ES: 0.48). Pain-VAS: baseline: 3.97 (±2.92); 4 weeks 2.61 (±2.11); 8 weeks 2.21 (±2.07); p=.0022; ES=0.6953 CHFS: baseline: 19.24 (±15.78); 4 weeks 16.86 (±15.42); 8 weeks 12.48 (±12.04); p<.0001; ES=0.4816.	No adverse events have occurred.
Landim, et al. [51]; 2020; quasi-experimental study; Brazil	SSc ♀ IG n=35 ♂ IG n=5 ♀ CG n=16 ♂ CG n=1	Home-based self-management programme (same as in Landim, et al. [50]); No primary outcome specified; 1) Hand pain 2) Hand function	1) Visual Analogue Scale (VAS) 2) Cochin Hand Function Scale (CHFS)	n=40 Mean age = 47.6 (±9.8)	n=17 Mean age = 49.8 (±10.7) No intervention	Outcome improvements were noted in the IG, CG did not change or had worsened. VAS-pain: CG baseline 3.47 (±3.12), follow up 4.35 (±3.32); IG baseline 4.82 (±2.75), follow up 1.93 (±1.99); comparison between groups p=0.5310, between times p=0.0040, interaction group vs time p<.0001, ES=-1.48 CHFS: CG baseline 24.12 (±16.60), follow up 27.76 (±18.03); IG baseline 24.30 (±17.50), follow up 11.00 (±12.21); comparison between groups p=0.0561, between times p=0.0005, interaction group vs time p<.0001, ES=-1.06	Not reported
Li, et al. [52]; 2020; RCT; Canada	SLE ♀ IG n=13	Physical Activity Counselling Program	1) SenseWear Mini (BodyMedia, Inc., Pittsburgh, PA.)	n=16 Mean age = 49.9 (±12.2)	n=16 Mean age = 47.1 (±13.8)	No significant between-group difference was found in any outcomes in participants with SLE.	After starting the program, 23 of the 118 participants

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
	♂ IG n=3 ♀ CG n=14 ♂ CG n=2	with Use of Wearable Tracker; 1) Time spent in moderate/vigorous physical activity (MVPA [mins/day])			Same intervention delayed	MVPA [mins/day]: IG baseline 21.8 (±28.5), 9 weeks 32.2 (±31.0); CG baseline 43.9 (±49.1), 9 weeks 46.3 (±45.8); Adjusted mean difference between groups (95% CI) 2.0 (-17.3, 21.3)	reported adverse events due to physical activity: 19 muscle pain (Immediate: n=10, Delay: n=9) and 4 ligament sprain (Immediate: n=3, Delay: n=1). Falls were reported by 5 participants in the Immediate Group (none happened during exercise), and 4 in the Delay Group (all happened during the waiting period). No other adverse events were reported.
Maddali-Bongi, et al.[53]; 2011; RCT; Italy	SSc ♀ IG n=20 ♀ CG n=15	Manual lymph drainage (MLD) 1) Reducing edema 2) Functionality of the hands 3) Quality of life and disability	1) Volumetric test performed by slowly dipping the hand in a cylinder full of water 2) Hand Mobility in Scleroderma (HAMIS), perception of hand disability was scored by 4 visual analog scales (VAS) 3) Physical synthetic index (PSI) and the Mental synthetic index (MSI) of the Short Form 36 (SF-36), Health Assessment Questionnaire (HAQ)	n=20 Mean age = 57.2 (±10.23)	n=15 Mean age = 57.35 (±12.6) observation group No intervention	In the intervention group, hand volume, the HAMIS test, and the 4 VAS were improved significantly at the end of treatment (P < 0.001). The results were maintained at T2 (P < 0.001). The HAQ and the PSI and MSI of the SF-36 also improved significantly at T1 (P < 0.001), but only PSI improvement was maintained at T2 (P < 0.001). In the observation group, no improvement at T1 and at T2 was observed. All of the patients were evaluated at enrolment (T0), at the end of the treatment (T1), and after a follow-up of 9 weeks (T2). Hand volume, cm3, mean (SD): IG T0 340.0 (±59.51), T1 310.7 (±51.84), T2 316.6 (±61.76), within p=0.0001(T0-T1), p=0.0001(T0-T2), p=ns(T1-T2); OG T0 343.7 (±51.25), T1 345.3 (±46.56), T2 350.2 (±46.90), within p=ns(T0-T1), p=ns(T0-T2), p=ns(T1-T2); between groups p=ns(T0-T1), p<0.05(T0-T2), p<0.01(T1-T2) HAMIS test, right hand, mean (SD): IG T0 8.15 (±4.28), T1 4.75 (±3.22), T2 5.7 (±4.27), within p=0.0001(T0-T1), p=0.0001(T0-T2), p=ns(T1-T2); OG T0 OG 8.4 (±5.14), T1 8.53 (±4.53), T2 8.93 (±4.7), within p=ns(T0-T1), p=n(T0-T2), p=ns(T1-T2); between groups p=ns(T0-T1), p<0.01(T0-T2), p<0.05(T1-T2) HAMIS test, left hand, mean (SD): IG T0 8.1 (±4.14), T1 4.35 (±3.17), T2 5.5 (±4.25), within p=0.0001(T0-T1), p=0.0001(T0-T2), p=ns(T1-T2); OG T0 OG 8.33 (±4.80), T1 8.47 (±4.51), T2 8.73 (±5.06), within p=ns(T0-	No adverse events occurred.

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Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
						T1), p=ns(T0-T2), p=ns(T1-T2); between groups p=ns(T0-T1), p<0.01(T0-T2), p<0.05(T1-T2) HAQ, mean (SD): IG T0 1.56 (±0.8), T1 0.88 (±0.7), T2 1.4 (±0.82), within p<0.001(T0-T1), p=ns(T0-T2), p<0.05(T1-T2); OG 1.47 (±0.90), T1 1.49 (±0.81), T2 1.53 (±0.94), within p=ns(T0-T1), p=ns(T0-T2), p=ns(T1-T2); between groups p=ns(T0-T1), p<0.05(T0-T2), p=ns SF-36 PSI, mean (SD): IG T0 38.77 (±7.91), T1 44.79 (±8.27), T2 44.10 (±7.25), within p<0.0001(T0-T1), p<0.0001(T0-T2), p=ns(T1-T2); OG 39.19 (±6.95), T1 38.95 (±7.35), T237.01 (±5.34), within p=ns(T0-T1), p<0.05(T0-T2), p=ns(T1-T2); between groups p=ns(T0-T1), p<0.05(T0-T2), p<0.01 SF-36 MSI, mean (SD): IG T0 38.21 (±6.69), T1 44.43 (±6.84), T2 39.72 (±5.82), within p<0.0001(T0-T1), p=ns(T0-T2), p<0.0001(T1-T2); OG 37.15 (±6.38), T1 38.76 (±6.46), T2 37.30 (±6.41), within p=ns(T0-T1), p=ns(T0-T2), p<0.0001(T1-T2); between groups p=ns(T0-T1), p<0.01(T0-T2), p=ns	
Maddali-Bongi, et al.[54]; 2009; RCT, Italy	SSc ♀ IG n=16 ♂ IG n=4 ♀ CG n=14 ♂ CG n=6	Combination of connective tissue massage and Mc Mennell joint manipulation; 1) Hand function	1) Hand Mobility in Scleroderma (HAMIS) test, Cochin hand functional disability scale, ROM (hand opening and fist closing expressed in centimetres were used to assess hand function)	n=20 Mean age = 56.4 (±10.2)	n=20 Mean age = 58.1 (±13.4) Home exercises only	IG fist closure, HAMIS test and Cochin hand functional disability scale improved (p<0.0001); CG only fist closure at the end of the treatment (p<0.0001). HAMIS test, mean (SD): IG pre 11.40 (±6.58), post 7.00 (±6.77), follow up 7.80 (±6.38); T0-T1 p<0.0001; T0-T2 p<0.0001; CG 10.75 (±4.60), post 11.10 (±4.61), follow up 10.95 (±3.97); T0-T1 p=ns; T0-T2 p=ns Cochin hand functional disability scale, mean (SD): IG 33.05 (±24.89), post 20.30 (±21.56), follow up 22.10 (±21.01); T0-T1 p<0.0001; T0-T2 p<0.0001; CG 31.80 (±18.81), post 32.50 (±18.40), follow up 33.25 (±17.97); T0-T1 p=ns; T0-T2 p=ns Hand opening, mean (SD): IG 15.60 (±1.09), post 16.03 (±1.40), follow up 15.57 (±1.60); T0-T1 p=ns; T0-T2 p=ns; CG 15.34 (±1.30), post 15.18 (±1.28), follow up 15.29 (±1.55); T0-T1 p=ns; T0-T2 p=ns First closure, mean (SD): IG 2.24 (±1.60), post 1.47 (±1.42), follow up 1.45 (±1.25); T0-T1 p<0.0001; T0-T2 p<0.0001; CG 2.20 (±1.08), post 1.19 (±1.00), follow up 2.19 (±1.09); T0-T1 p<0.0001; T0-T2 p=ns	Not reported in the article.
Maddali-Bongi, et al.[55]; 2009; RCT; Italy	SSc ♀ IG n=6 ♂ IG n=4 ♀ CG n=7 ♂ CG n=3	District specific and global rehabilitation program; no primary outcome defined, 1) Patients' global health condition 2) Specific body districts (hand, face)	Baseline (T0); end of the 9-week rehabilitation period (T1); IG 9-week follow-up (T2). 1) Medical Outcomes Survey Short Form (SF-36), Health Assessment Questionnaire Disability index (HAQ-DI) 2) Hand Mobility in Scleroderma	n=10 Mean age = 58.0 (±15.1)	n=10 Mean age = 55.7 (±14.9) No intervention	IG, patients improved significantly at the end of the treatment, however, the significance was lost at the 9-week follow-up (excluded the HAMIS test (p<0.01) and mouth opening (p<0.01)). CG did not show any significant improvement in general health condition, hands and face measures at the end of the study (no details displayed in the article). No between-groups testings. Changes in the IG:	Not reported in the article.

Supplemental material

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			(HAMIS) Test, Duruoz scale, range of motion [ROM] (hand opening, fist closing), water volumetric test, mouth opening, 16-Item VAS-face			MSI (SF-36), IG, mean (SD): T0 36.9 (±6.0), T1 44.6 (±6.0); T2 34.7 (±4.6); within T0-T1 p<0.005; within T0-T2 p=ns PSI (SF-36), IG, mean (SD): T0 37.9 (±7.9), T1 44.9 (±8.6); T2 39.0 (±7.9); within T0-T1 p<0.05; within T0-T2 p=ns HAQ, IG, mean (SD): T0 1.2 (±1.2), T1 0.9 (±1.1 0.8); T2 (±1.2); within T0-T1 p<0.05; within T0-T2 p=ns HAMIS TEST, IG, mean (SD): T0 10.2 (±4.8), T1 6.0 (±3.7); T2 6.4 (±7.4); within T0-T1 p<0.005; within T0-T2 p<0.01 DURUOZ SCALE, IG, mean (SD): T0 23.3 (±19.9), T1 14.0 (±16.0); T2 17.3 (±17.2); within T0-T1 p<0.01; within T0-T2 p=ns Hand opening* (cm), IG, mean (SD): T0 16.7 (±1.3), T1 16.4 (±1.7); T2 14.7 (±3.1); within T0-T1 p=ns; within T0-T2 p=ns Fist closure* (cm), IG, mean (SD): T0 1.4 (±2.2), T1 0.4 (±0.9); T2 0.5 (±0.8); within T0-T1 p<0.05; within T0-T2 p=ns Mouth opening (cm), IG, mean (SD): T0 3.4 (±1.1), T1 4.0 (±1.2); T2 4.8 (±1.4); within T0-T1 p<0.05; within T0-T2 p<0.01 FACE-VAS, IG, mean (SD): T0 3.7 (±1.3), T1 3.1 (±1.1); T2 3.8 (±0.9); within T0-T1 p<0.002; within T0-T2 p=ns	
Maddali-Bongi, et al. [56]; 2010; RCT; Italy	SSc ♀ IG n=18 ♂ IG n=2 ♀ CG n=16 ♂ CG n=4	Combination of Kabat's technique, connective massage and kinesitherapy; 1) Face functioning	Baseline (T0), end of the treatment (T1) and 9 weeks of follow-up (T2) 1) Mouth Handicap in Systemic Sclerosis (MHISS); Mouth opening in centimeters, Rodnan skin score	n=20 Mean age = 57.20 (±10.23)	n=20 Mean age = 57.35 (±12.60) home exercise program alone	At T1, both groups improved in mouth opening (P < 0.05), but at T2 only in IG maintained. IG, facial skin score ameliorated at T1 and maintained at T2 (P < 0.05 vs. T0), no changes in CG. No changes in SF-36 and HAQ for both groups. MHISS improved in IG at T1 (P < 0.001), no changes in CG. Mouth opening (cm), mean (SD): IG T0 3.80 (±1.06); T1 4.28 (±0.99); T2 4.58 (±1.16); between groups T0-T1 p<0.05; T0-T2 p<0.001 Skin score, mean (SD): IG T0 3.90 (±1.55); T1 1.60 (±0.99); T2 1.75 (±1.02); between groups T0-T1 p<0.001; T0-T2 p<0.001 MHISS, mean (SD): IG T0 17.20 (±5.15); T1 16.25 (±5.64); T2 18.50 (±5.23); between groups T0-T1 p<0.001; T0-T2 p=ns Mouth opening (cm), mean (SD): CG T0 4.00 (±1.09); T1 4.48 (±1.04); T2 4.20 (±1.05); between groups T0-T1 p<0.001; T0-T2 p=ns Skin score, mean (SD): CG T0 3.55 (±1.43); T1 3.15 (±1.63); T2 3.35 (±1.18); between groups T0-T1 p=ns; T0-T2 p=ns MHISS, mean (SD): CG T0 18.10 (±5.36); T1 18.00 (±4.97); T2 17.90 (±4.03); between groups T0-T1 p=ns; T0-T2 p=ns	Not reported in the article.
Maisiak, et al. [57]; 1996; RCT; USA	SLE ♀ IG n=8	telephone-based counselling intervention:	1) Arthritis Impact Measurement Scales (AIMS)	n=8	n=7	significantly improved the psychological status of the SLE patients (P < 0.05, effect size = 1.13, responsiveness = 0.77) in comparison to usual care.	Not reported in the article

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
	☿ CG n=7	1) Improving psychological status		Mean age = 37.13 (SD not reported)	Mean age = 40.43 (SD not reported) usual care	AIMS Psychological Dysfunction, mean (SD not reported): IG pre 3.81, post 4.30 (adjusted mean for baseline=4.52), CG pre 4.76, post 3.76 (adjusted mean for baseline=3.49); ES 1.13, p=0.02	
Mancuso and Poole [58]; 2009; series of single-case studies; USA	SSc ☿ IG n=3	Paraffin and active hand exercises; 1) Improve activity and participation	1) Duruoz Hand Index (DHI), Scleroderma Functional Assessment Questionnaire (SFAQ), Applied Dexterity items from the AHFT.	n=3 Age = 83, 47, 61 years	n.a.	Case 1: no improvements in hand function during daily activities on most items included on the DHI and SFAQ. The participant did, however, report that she felt the intervention helped overall in her daily activities, including playing the piano, which was a daily hobby for this participant. Case 2: no improvements in hand function related to activity/participation on most items included on the DHI and SFAQ. The participant did report, however, that she felt the intervention helped overall in her daily activities at both work and home. Case 3: experienced improvements in measures of both body function/structure and measures of activity/participation. Additionally, this participant reported improvements in several daily activities not reflected in the DHI and SFAQ tools.	Not reported in the article.
Martin [59]; 2009; single case study; Brazil	SSc ☿ IG n=1	Myofascial release; primary outcome was not specified, 1) Functionality of temporomandibular joint 2) Functionality of the fingers/arm	1) functionality (pain and clicking noise), mouth opening 2) Goniometer/centimeters	n=1 no age reported	n.a	1) Pre-intervention: pain and bilateral clicking noises; post-intervention the absence of pain and a sensation of ''normality'' in the TMJ when eating Mouth opening: pre-intervention distance between the upper and lower teeth 26mm; post-intervention 34mm 2) Pre-intervention: edema throughout the RUL, especially the extensor tendons (radial and ulnar) of the wrist; edema on fascia of the palm of the hand; reduction in the length of the fingers and the distance between them, decrease in ROM; post-intervention: remaining nodules, pain in the fingers and the muscles of the wrist, during activities and on intense touch.	Not reported in the article.
McNearney, et al. [60]; 2013; one-group pretest–posttest design; USA	SSc ☿ IG n=14 ♂ IG n=3	Transcutaneous electrical nerve stimulation (TENS); 1) Neurogastric functioning	1) Multi-channel surface electrogastrography (EGG);	n=17 Mean age = 55 (±2.28)	n.a.	Only after prolonged TENS, the percentages of normal slow waves and average slow wave coupling (especially channels 1, 2 reflecting gastric pacemaker and corpus regions) were significantly increased (visit 2 compared to visit 1 for baseline 82.1±4.2% vs. 63.4±5.6%, respectively, p=0.02 and modest increases in postprandial intervals (83.05±4.29% vs. 78.4±0.49%, respectively, p=NS). The percentage of normal slow waves was significantly correlated to sympathovagal balance.	Not reported in the article.
Miljeteig and Graue [61]; 2009; action research	SLE ☿ IG n=13	Educational program; primary outcome was not specified, 1) Pain	1) Visual analogue scale (VAS) 2) Visual analogue scale (VAS) 3) Medical Outcome Scale Short Form-36 (SF-36)	n=13 Mean age = 35.3 (±10.5)	n.a.	The mean scale score for general health (SF-36) improved significantly (p = 0.029) from 47.3 (SD 17.5) to 56.0 (SD 13.2) (n = 13). Mean mental health scale score showed an insignificant increase (p = 0.091) from	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
approach; Norway		2) Fatigue 3) Quality of life				76.7 (SD 16.3) to 84.0 (SD 10.9 (n = 13). The results related to scale scores for pain, fatigue and physical well-being were non-significant.	
Mitropoulos, et al. [62]; Mitropoulos, et al. [63]; 2019; RCT; UK	SSc ♀ n=29 ♂ n=3Ω	High-intensity interval training (HIIT) combined with resistance training (RT); 1) Microvascular function	1) Laser Doppler Fluximtery and Iontophoresis	n=16 Mean age = 69.6 (±11.4)	n=16 Mean age = 63.6 (±12.2) No intervention	Compared to control group after the exercise intervention, the time to peak endothelial-dependent (91 ±42 s, d=1.06, p=0.007), the endothelial-independent function (3.16 ± 2, d=1.17, p=0.005), and baseline (5.71 ± 4.4, p < 0.05) and peak (15.4 ± 7.5, p < 0.05) transcutaneous oxygen pressure were significantly improved.	No adverse events have occurred.
Mitropoulos, et al. [64]; 2018; RCT; United Kingdom	SSc ♀ n=31Ω ♂ n=3	High-intensity interval training cycling (CE) and arm cranking (ACE); 1) Microcirculation of the digital area	1) Laser Doppler Fluximtery and Iontophoresis technique in a temperature-controlled room (22–24 °C)	IG (ACE) n=11 Mean age (ACE) = 69.1 (±9.7) IG (CE) n=11 Mean age (CE) = 65.1 (±10)	n=12 Mean age = 62.2 (±14.3) No exercise intervention	Endothelial-dependent vasodilation improvement was greater in the arm-cranking (p < 0.05, d = 1.07) in comparison to other groups.	No adverse events have occurred.
Mouthon and Thombs [65]; 2020; study protocol, Canada	SSc	SPIN-HAND Program 1) Difference in Cochin Hand Function Scale	1) Cochin Hand Function Scale (CHFS)	n.a	n.a	n.a	n.a
Mugii, et al. [66]; 2006; quasi-experimental study; Japan	SSc ♀ IC n=39 ♂ IC n=6 ♀ CG n=16 ♂ CG n=5 healthy controls	Self-administered stretching of each finger; 1) Functionality	1) Passive Range of motion (pROM), Health assessment questionnaire disability index (HAQ-DI)	n=45 Mean age = 48.6 (±17.3)	n=21 Mean age = 49.0 (±13.0) healthy controls No intervention	The total pROM was significantly improved in each finger after 1 month of finger stretching. The total pROM was further improved or maintained within 1 year after the first visit. HAQ-DI total not significant (baseline 0.48 ± 0.45; 1 year 0.38 ± 0.47)	Not reported in the article.
Mugii, et al. [67]; 2018; retrospective, observational cohort study; Japan	SSc ♀ IC n=35 ♂ IG n=8	Self-administered stretching of each finger; 1) Functionality	1) Passive Range of motion (pROM), Health assessment questionnaire disability index (HAQ-DI)	n=43 Median age = 51 (range 7-73)	n.a.	pROM significantly improved in each finger after 1 year and further improved or maintained within 3 years; in 37 of 43 patients (86%) improved or maintained total pROM and hand function within 9 years; improvement of total pROM was lost in 6 of 43 SSc patients (14%); HAQ-DI also increased in these 6 patients. HAQ-DI was analyzed in 29 patients; no significant improvements.	Not reported in the article.
Murphy [68]; 2019; study protocol, USA	SSc	Intensive treatment 1) improve arm function	1) physical function and symptoms with the self-report questionnaire, quickDASH	n.a	n.a	n.a	n.a
Murphy, et al. [69]; 2018; one-group	SSc ♀ IG n=18 ♂ IG n=3	Occupational therapy 1) Extremity function (contractures)	1) QuickDASH questionnaire	n=21	n.a.	At 8 weeks significant improvement in the QuickDASH (P = 0.0012). Approximately one-half of participants in the sample achieved	No adverse events occurred.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
pretest–posttest design; USA				Mean age = 47.9 (±16.1)		improvement in the QuickDASH that exceeded minimally important differences. QuickDASH score (squares mean (SE) changes over time) baseline 49.3 (4.6); 4 weeks 42.7 (4.8); 8 weeks 35.2 (4.8), p=0.0012	
Navarrete-Navarrete, et al. [70]; 2010; RCT; Spain	SLE ♀ IC n=17 ♂ IC n=4 ♀ CG n=23 ♂ CG n=1	Cognitive-behavioural intervention; 1) Stress reduction	1) Stress Vulnerability Inventory (SVI), Survey of Recent Life Experiences (SRLE), Beck Depression Inventory (BDI), Spielberger's State-Trait Anxiety Inventory (STAI-T)	n=21 Mean age = 43.77 (±89.88)	n=24 Mean age = 40.41 (±10.67) Usual care	significantly reduced stress, anxiety and depression; after therapy, levels of anxiety and depression were considerably lower and even fell below the population average. **SVI**, mean (±SD): T0 IG 12.5 (±4.9), CG 12.5 (±5.9), p=0.963; T3 IG 7.8 (±4), CG 11.6 (±6), p=0.017; T9 IG 7.5 (±6.6), CG 11.3 (±6.1), p=0.050; T15 IG 6.3 (±6.3), CG 12.1 (±5.5), p=0.001: within groups IG T0–T3 (ES 1.07, p<0.008); T0–T9 (ES 0.86, p<0.008); T0–T15 (ES 1.09, p<0.008); within groups CG T0–T3 (ES 0.13, p=ns); T0–T9 (ES 0.19, p=ns); T0–T15 (ES 0.06, p=ns) **SRLE**, mean (±SD): T0 IG 90 (±21.6), CG 91.9 (±19.8), p=0.776; T3 IG 79.2 (±6.7), CG 93 (±17.7), p=0.012; T9 IG 79.5 (±16.7), CG 94.4 (±20.1), p=0.011; T15 IG 82.3 (±16.4), CG 99.2 (±26.3), p=0.016: within groups IG T0–T3 (ES 0.57, p=ns); T0–T9 (ES 0.55, p=ns); T0–T15 (ES 0.41, p=ns); within groups CG T0–T3 (ES 0.05, p=ns); T0–T9 (ES 0.12, p=ns); T0–T15 (ES 0.31, p=ns) **BDI**, mean (±SD): T0 IG 13.3 (±10), CG 16.6 (±11.2), p=0.308; T3 IG 7.8 (±6.6), CG 17.1 (±13.1), p=0.006; T9 IG 10.3 (±9.4), CG 14.8 (±11), p=0.161; T15 IG 7.6 (±7.2), CG 16.5 (±10.8), p=0.003: within groups IG T0–T3 (ES 0.66, p=ns); T0–T9 (ES 0.31, p=ns); T0–T15 (ES 0.66, p=ns); within groups CG T0–T3 (ES 0.03, p=ns); T0–T9 (ES 0.16, p=ns); T0–T15 (ES 0.00, p=ns) **STAI-T**, mean (±SD): T0 IG 63 (±28.2), CG 68.8 (±24), p=0.465; T3 IG 44 (±31), CG 69.1 (±26.3), p=0.008; T9 IG 43.4 (±33.6), CG 62.2 (±30.4), p=0.064; T15 IG 42.4 (±26.4), CG 66.5 (±27.3), p=0.007a: within groups IG T0–T3 (ES 0.63, p=ns); T0–T9 (ES 0.63, p=ns); T0–T15 (ES 0.75, p=ns); within groups CG T0–T3 (ES 0.01, p=ns); T0–T9 (ES 0.2, p=ns); T0–T15 (ES 0.09, p=ns)	Not reported in the article.
Naylor [71]; 1982; single case study; USA	SSc ♀ IG n=1	Oral augmentation program (exercises); Improve 1) Mastication and oral hygiene	1) Mouth opening: The oral opening was measured from the incisal edge of the maxillary right central incisor to the incisal edge of the mandibular right lateral incisor	n=1 Age = 38	n.a.	6-mm (27.3%) increase in the oral aperture obtained in this case was achieved in only 12 weeks.	No adverse effects occurred.
Naylor, et al. [72]; 1984; RCT; USA	SSc IG n=5 CG n=4 Gender not reported.	Comparison of two different exercise programs 1) Oral opening	1) Mouth opening	n=5 Age not reported.	n=4 Age not reported.	IG mean improvement 5.6 mm (range, 3 to 8 mm) CG 3.0 mm (range, 0 to 6 mm), p=ns	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
					"facial grimacing" exercises		
Neville, et al. [73]; 2016; qualitative interview study; Canada	SLE ♀ IG n=43	Development of the Lupus Interactive Navigator (LIN), a web-based self-management program for persons with SLE, and; 1) Test the LIN for usability and acceptability	1) Number of log-ins, duration of each session, contacted for a 30-minute telephone interview to assess their opinions about the LIN and to identify areas for improvement.	n=43 Mean age = 43.6 (±15.9)	n.a.	Median time spent on LIN 16.3 minutes (interquartile range [IQR]:13.7, 53.5), median number of sessions 2 (IQR: 1, 3). Interview: LIN was easy to use, would recommend, 73% of the participants rated all topics helpful to very helpful, useful to those newly diagnosed with SLE.	Not reported in the article.
Ng and Chan [74]; 2007; quasi-experimental study; China	SLE ♀ IG n=56 ♀ CG n=20	Group Psychosocial Program; 1) Psychological Well-Being	1) Self-administered questionnaire designed, including mental health (Chinese version of General Health Questionnaire-30 (GHQ-30)), and self-esteem (Chinese version of the Rosenberg Self-Esteem Scale (RSE))	n=56 Mean age = 42.5 (range 20 to 55)[∀]	n=20 Mean age = 42.5 (range 20 to 55)[∀] no intervention	Better scores in self-esteem (p < 0.001) and GHQ (p < 0.001) after the group (within groups). RSE IG pre 24.50, post 28.14, p<0.001; CG pre 23.45, post 18.45, p<0.001 GHQ-30 IG pre 38.23, post 19.02, p<0.001; CG pre 31.05, post 66.45, p<0.001	Not reported in the article.
O'Riordan, et al. [75]; 2017; mixed methods; Ireland	SLE ♀ IG n=21	Fatigue and Activity Management Education (FAME); primary outcome was not specified, 1) Occupational participation 2) Fatigue	1) Frenchay Activities Index (FIA) 2) Fatigue Severity Scale (FSS)	n=21 Mean age = 48.05 (±15.25)	n.a.	No significant differences in the FIA or the FSS scores over time. Data collection occurred before intervention: Time 1 (T1); immediately after intervention: Time 2 (T2); and eight weeks after completion of FAME: Time 3 (T3). FAI 31, median (range): T1 (22–41), T2 32 (16–41), T3 29 (14–39); T1-T2 p=0.726; T2-T3 p=0.609; T1-T3 p=0.753 FSS, median (range): T1 5.33 (1.9–6.9), T2 5.11 (3.4–6.4), T3 5.11 (2.9–6.2); T1-T2 p=0.370; T2-T3 p=1.000; T1-T3 p=0.306	FAI scores either remained the same or reduced slightly; This could be viewed as an adverse event given the importance of occupational participation for physical and psychological wellbeing.
O'Connor, et al. [76]; 2016; series of single-case studies (ABA); Canada	SSc ♀ IG n=6	Osteopathic manipulative treatment (OMT); no primary outcome defined, 1) Hand function 2) Disease symptoms 3) Functional status	1) Hand stiffness, range of motion of the fingers (ROM), distal upper limbs skin score, disease symptoms (pain, dyspnea and fatigue), hand and global disability, work disability and health-related quality of life	n=6 Mean age = 50.17 (±9.85)	n.a.	All participants (n=6/6) improved in hand stiffness and in range of motion of the fingers, and most improved on distal upper limbs skin score (n=4/6). Disease symptoms improved (pain: n=6/6, dyspnea: n=3/4, fatigue: n=4/6) as did functional status (global disability: n=5/5, work disability: n=4/6, health related quality of life, physical (n=6/6) and mental (n=4/6) components). When comparisons were possible, almost all observed improvements were greater than minimal clinically important differences suggested for this population.	No adverse events occurred.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
Oliveira, et al. [77]; 2009; quasi-experimental study; Brazil	SSc ♀ IC n=7 ♀ CG n=7 healthy controls	Aerobic exercise; 1) Aerobic capacity	1) Cardiopulmonary stress test, blood lactate concentration assessment, oxygen saturation assessment	n=7 Mean age = 45.57 (±8.22)	n=7 healthy controls Mean age = 43.29 (±4.89) Same as IG	After 8 weeks SSc patients and controls significant improvement in VO2 peak (19.72 ± 3.51 vs. 22.27 ± 2.53 and 22.94 ± 4.70 vs. 24.55 ± 3.00, respectively; p = 0.006 time effect; and p = 0.468 interaction effect);no differences between groups (p = 0.149); SSc and control higher exercise intensity (1.43 ± 0.51 vs. 1.84 ± 0.33 and 1.11 ± 0.45 vs. 1.59 ± 0.25, respectively; p = 0.01 for time effect; p = 0.088 for group effect; and p = 0.848 for interaction effect) measured by peak blood lactate; resting oxygen saturation did not improve with exercise for either the SSc or the control group when compared to baseline data (90.71 ± 5.79 vs. 92.43 ± 8.42 and 97.00 ± 1.15 vs. 97.43 ± 0.53, respectively; p = 0.481 for time effect; p = 0.671 for interaction effect; and p = 0.032 for group effect).	No worsening of the disease because of the intervention.
Parisi, et al. [78]; 2017; one-group pretest–posttest design; Italy	SSc ♀ IG n=53	Neuromuscular Taping; 1) Hand functioning	(T0) and immediately at the end of the treatment (T1) and after one month (T2) three months (T3) and six months (T4) 1) Cochin Hand Functional Disability scale (CHFDS), Modified Rodnan Skin Score (MRSS), Hand Mobility in Sclerodermia (HAMIS), Dreiser Algo - Functional Index (IAFD), pain using the Visual Analogic scale (VAS)	n=53 Mean age = 50.79 (±8.89)	n.a.	Cochin Hand Functional Disability scale, Hand Mobility in Sclerodermia, Modified Rodnan Skin Score and Dreiser Algo - Functional Index scores showed statistical significant differences during all the period; moreover, a reduction of pain has been observed. CHFDS: T0 34 (30-38); T1 19 (15-24); T2 23 (21-26); T3 27 (24-32); T4 31 (27-39); p T0/T4 0,000; P T4-T0 0,000; P T1-T0 0,000 MRSS: T0 15,0 (13-19); T1 10 (8-14); T2 13 (10-15); T3 15 (12-17); T4 15 (13-19); p T0/T4 0,000; P T4-T0 0,31; P T1-T0 0,000 HAMIS: T0 12 (10-17); T1 7 (5-10); T2 9 (8-12); T3 10 (8-14); T4 12 (9-16); p T0/T4 0,000; P T4-T0 0,31; P T1-T0 0,000 IAFD: T0 21 (18-29); T1 13 (11-16); T2 15 (14-17); T3 19 (16-21); T4 21 (19-25); p T0/T4 0,000; P T4-T0 0,18; P T1-T0 0,000 VAS; T0 60,6 (40,4-77,5); T1 10,6 (6,2-20,5); T2 20,2 (11,5-32,9); T3 36,8 (24,2-48,1); T4 53,7 (41,5-62,5); p T0/T4 0,000; P T4-T0 0,000; P T1-T0 0,000	No adverse events occurred.
Perandini, et al. [79]; 2014; quasi-experimental study; Brazil	SLE ♀ IG n=8 ♀ CG n=10 healthy controls	12-week exercise training program; 1) Cytokines and soluble TNF receptors (sTNFRs)	1) Cytokines and sTNFRs. IFN-, IL-10, IL-6, TNF, sTNFR1, and sTNFR2 were measured by a multiplex human panel using a Luminex 200 apparatus.	n=8 Mean age = 35.8 (±6.5)	n=10 (healthy controls) Mean age = 30.6 (±5.2) Same Exercises	After exercise training program, a decrease in resting TNFR2 levels (p=0.025) and a tend to reduction interleukin (IL)-10 levels (p=0.093); resting levels of IL-6, IL-10, and TNF-α reached HC levels (p=0.05). Detailed values are not reported (figures only).	Not reported in the article.
Piga, et al. [80]; 2014; RCT; Italy	SSc ♀ IC n=9 ♀ CG n=8	Recovery of Movement and Telemonitoring (Re.Mo.Te.); telemonitoring approach to self-	1) Dreiser's index (Functional Index for Hand OA, FIHOA), Health Assessment Questionnaire (HAQ), the Hand Mobility in Scleroderma (HAMIS) test	n=9 Mean age = 57.0 (±10.0)	n=8 Mean age = 57.4 (±11.7)	Patients with SSc showed an improvement of FIHOA in both arms (p < 0.01) but the HAQ (p = 0.016) and the HAMIS test (right hand p = 0.016, left hand p = 0.075) improved significantly only in the experimental arm. Dreiser's Index, mean (±SD): IG baseline 13.9 (± 6.0); IG 6th week 9.9 (± 6.8); IG 12th week 7.7 (± 5.2); withingroup p=0.006; CG baseline 14.0 (±	No adverse events have occurred.

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		managed kinesiotherapy sessions; 1) Hand function			Kinesiotherapy, no monitoring	6.4); CG 6th week 12.0 (± 6.5); CG 12th week 9.50 (± 5.2), within p=0.006, between groups p=0.496 HAQ, mean (±SD): IG baseline 1.49 (± 0.4); IG 6th week 0.76 (± 0.6); IG 12th week 0.81 (± 0.6); withingroup p=0.016; CG baseline 1.56 (± 0.7); CG 6th week 1.06 (± 0.6); CG 12th week 1.09 (± 0.5), within p=0.063, between groups p=0.287 HAMIS R hand, mean (±SD): IG baseline 5.2 (± 6.2); IG 6th week 3.8 (± 6.6); IG 12th week 3.3 (± 6.0); withingroup p=0.016; CG baseline 4.7 (±3.0); CG 6th week 3.2 (± 2.4); CG 12th week 3.2 (± 2.4), within p=0.104, between groups p=0.832 HAMIS L hand, mean (±SD): IG baseline 4.7 (± 4.1); IG 6th week 3.1 (± 4.3); IG 12th week 2.2 (± 3.2); withingroup p=0.075; CG baseline 2.2 (± 2.0); CG 6th week 1.6 (± 2.0); CG 12th week 1.7 (± 2.1), within p=0.529, between groups p=0.401	
Pinto, et al.[81]; 2011; one-group pretest–post test design; Brazil	SSc ♀ IG n=11	Exercise Training Program; primary outcome was not specified. 1) Muscle strength 2) Muscle function 3) Muscle damage 4) Aerobic capacity	1) One-Repetition-Maximum test (1-RM) 2) Timed up-and-go (TUG), and timed-stands tests 3) Blood concentration of creatine kinase (CK) and aldolase 4) Cardiopulmonary Exercise Test (VO2peak, HR)	n=11 Mean age = 44 (±13)	n.a.	1) Leg press (mean kg) (pre 67 [±23]; post 95 [±27]; p=0.0006 ES=1.6) Bench press (mean kg) (pre 37 [±17]; post 42 [±17]; p=0.08 ES=0.5) Handgrip (mean kg) (pre 20 [±9]; post 22 [±11]; p=0.02 ES=0.2) Low back strength (mean kg) (pre 59 [±27]; post 73 [±24]; p=0.001 ES=1.4) 2) Timed-up-and-go (mean s) (pre 6.9 [±0.7]; post 6.3 [±0.7]; p=0.12 ES=0.6) Timed-stands (mean n) (pre 15 [±2]; post 17 [±3]; p=0.04 ES=1.3) 3) CK (pre 5.2 [±2.3]; post 5.4 [±2.3]); Aldolase (pre 113 [±87]; post 122 [±90]; p=0.1 and ES=0.2) 4) VO2peak (pre 21.6 [±1.2], post 22.1 [±1.6]; p = 0.7; ES = 0.2) Heart rate after the exercise training program (pre 101.7 [±3.5], post: 92.8 [±5.1]; p = 0.02; ES = 0.8).	No adverse events have occurred.
Pizzo, et al.[82]; 2003; quasi-experimental study; Italy	SSc ♀ IG n=10	Exercise program (mouth-stretching and oral augmentation exercises); 1) mouth opening	1) Distance between the incisal edge of upper and lower first incisors	n=5 Dentate subjects Mean age = 48.0 (±8.51)	n=5 Edentulous subjects[①] Mean age = 65.6 (±3.97)	After 18 weeks mouth opening improved in subjects, without significant differences between groups. Dentate mouth opening mm (mean±SD) (T0 [26.6±2.3]; T1 [36.4±2.51]; change in mm [37.3±9.88]; p<0.001) Edentulous mouth opening mm (mean±SD) (T0 [25.4±0.89]; T1 [37±1.58]; change in mm [45.78±7.26]; p<0.001) All mouth opening mm (mean±SD) (T0 [26±1.76]; T1 [6.7±2]; change in mm [41.54±9.32]; p<0.001)	No adverse events have occurred.
Poole, et al.[83]; 2013; one-group pretest–post test design; USA	SSc ♀ IG n=54 ♂ IG n=7	Mail-delivered self-management program; primary outcome was not specified,	1) Health log, Arthritis Self-Efficacy Scale (ASS), The Health Assessment Questionnaire (HAQ), Scleroderma Functional Assessment Questionnaire, Multidimensional Assessment of Fatigue Scale, The Center for	n=61 Mean age (only for completers n=49) = 53.9 (±12.5)	n.a.	Only statistically significant improvement was in self-efficacy for pain. Self-efficacy pain (mean[SD]): pre 5.2 [±2.7]; post [6.4 [±2.7]; change 1.2 [±2.9]; p=0.006 Self-efficacy function (mean[SD]): pre 7.6 [±3.0]; post [7.4 [±2.2]; change −0.2 [±2.8]; p=0.59	Not reported in the article.

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		1) Effectiveness of the program	Epidemiologic Studies Depression Scale (CES-D), Program evaluation interviews			Self-efficacy other (mean[SD]): pre 6.4 [±2.6]; post [7.0 [±2.2]; change 0.6[±3.0]; p=0.18 Self-efficacy total (mean[SD]): pre 6.6 [±2.1)]; post [6.5 [±2.5]; change −0.1 [±2.8]; p=0.86 Multidimensional fatigue scale (MAF) (mean[SD]): pre 26.1 [±11.5]; post [24.6 [±11.6]; change −1.5 [±8.1]; p=0.20 Depression (CES-D) (mean[SD]): pre 14.4 [±10.9]; post [14.3 [±10.8]; change −0.1 [±7.9]; p=0.93 Activity disability (HAQ) (mean[SD]): pre 0.9 [±0.7]; post [0.9 [±0.7]; change 0.0 ([±0.4]; p=0.56 Pain (mean[SD]): pre 2.9 [±2.6]; post [2.8 [±2.6]; change −0.05 [±1.9]; p=0.87 Hand disability (SFAQ) (mean[SD]): pre 6.8 [±5.8]; post [6.4 [±5.5]; change −0.3 [±2.8]; p=0.39 Number doctor visits (mean[SD]): pre 6.6 [±6.5]; post [5.9 [±6.2]; change −0.6 [±5.5]; p=0.19 Number ED visits (mean[SD]): pre 0.2 [±0.6]; post [0.2 [±0.6]; change 0 [±0]; p=1.0 Number of overnight stays in hospital (mean[SD]): pre 0.0 [±0.2]; post [0.1 [±0.5]; change 0.1 [±0.5]; p=0.38 Total number of nights spent in hospital (mean[SD]): pre 0.1 [±0.4]; post [0.4 [±1.8]; change 0.3 [±1.8]; p=0.38	
Poole, et al.[84]; 2014; one-group pretest–post test design; USA	SSc ♀ IG n=14 ♂ IG n=2	interactive internet-based SSc self-management program; primary outcome was not specified, 1) Effektiveness of the program	1) The Chronic Disease Self-Efficacy Scale (SE Scale), The Health Education Impact Questionnaire (heiQ), The Patient Activation Measure (PAM), The Center for Epidemiologic Studies Depression Scale (CES-D), The Health Assessment Questionnaire (HAQ) disability index, pain VAS	n=16 Mean age = 52.2 (±10.2)	n.a.	There were significant improvements in mean scores for ability to manage care (effect size [ES] 0.62, P = 0.025) and health efficacy (ES 0.72, P = 0.012), and significant decreases in fatigue (ES -0.55, P = 0.045) and depression (ES -0.71, P 0.013). SE Scale (mean[SD]): pre 57.3 [±11.7]; post 63.9 [±13.1]; change 6.52; ES 0.46; p=0.084 heiQ (mean[SD]): pre 114.6 [±9.9]; post 120.6 [±7.7]; change 6.03; ES 0.72; p=0.012 PAM (mean[SD]): pre 38.5 [±5.2]; post 41.5 [±5.0]; change 3.00; ES 0.62; p=0.025 CES-D (mean[SD]): pre 20.7 [±9.6]; post 16.4 [±8.9]; change -4.25; ES -0.71; p=0.013 HAQ DI (mean[SD]): pre 1.0 [±0.6]; post 1.1 [±0.5]; change 0.01; ES 0.02; p=0.93 Pain VAS (mean[SD]): pre 6.7 [±1.6]; post 6.3 [±1.5]; change -0.48; ES -0.31; p=0.24 Fatigue VAS (mean[SD]): pre 8.1 [±1.4]; post 7.6 [±1.4]; change -0.52; ES -0.55; p=0.05	Not reported in the article.

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						Self-rated health (mean[SD]): pre 3.8 [±0.8]; post 3.8 [±0.7]; change 0; ES 0	
Poole, et al.[85]; 2010; one-group pretest–post test design; USA	SSc ♀ IG n=15 ♂ IG n=2	Structured oral hygiene instructions and facial and hand exercises; 1) Oral hygiene	1) Patient Hygiene Performance Index (PHP).	n=17 Mean age = 54,0 (±SD not reported)	n.a.	At 6-month intervention, there was a significant decrease (improvement) in mean PHP scores.

PHP score (mean [±SD]): baseline (3.3 [±0.64], range (1.8–4.2); pre-intervention (2.9 [±0.64], range 1.7–3.8); post-intervention (2.7 [+0.51], range 1.8–3.7); p<0.05 from baseline to post-intervention | Not reported in the article. |
| Prado, et al.[86]; 2013; RCT; Brazil | SLE (childhood onset)

IC n=10[Ω] CG n=9 Healthy CG n=10 | Supervised aerobic training program 1) Improving the cardiorespiratory capacity | 1) Cardiorespiratory exercise test was performed on a treadmill (Oxygen consumption (VO2) and carbon dioxide output, Heart Rate (HR), Peak oxygen consumption (peak VO2), VAT and RCP | IC n=10

Mean age = 12.9 (±2.3) | CG n=9

Mean age = 13.0 (±1.8)

No training

Healthy controls n=10

Mean age = 12.0 (±1.8) | exercise training program was effective in promoting significant increases in time-to exhaustion (P = 0.01; ES = 1.07), peak speed (P = 0.01; ES = 1.08), peak VO2 (P = 0.04; ES = 0.86), CR (P = 0.06; ES = 0.83), and in ΔHRR1 and ΔHRR2 (P = 0.003; ES = 1.29 and P = 0.0008; ES = 1.36, respectively) compared with CG; cardiorespiratory parameters were comparable to healthy controls: ANOVA analysis (P > 0.05). SLEDAI-2K scores remained stable throughout the study. | No adverse events have occurred. |
| Prado, et al.[87]; 2011; single case study; Brazil | Juvenile SLE (JSLE) and antiphospho lipid syndrome ♂ IG n=1 | Exercise training; primary outcome was not specified, 1) Physical capacity 2) Functioning | 1) V02max, time to exhaustion, peak exercise intensity 2) Visual analog scale scores (VAS) | n=1

Age: 15 | n.a. | All the cardiopulmonary parameters improved: V02max pre 30.6, post 41.6, change +36.0% time to exhaustion pre 7.15, post 12, change +67.8% peak exercise intensity pre 3-0, post 3.5-0, change +16.7% VAS improved patient's evaluation (pre = 8, post = 10), parents' evaluation (pre = 8 post = 10), physicians' evaluation (pre = 6 post = 9) | No adverse events have occurred. |
| Ramsey-Goldman, et al.[88], 2000; pilot RCT; USA | SLE ♀ IG n=5 (AER) ♀ IG n=5 (ROM) | AER= aerobic exercise group; ROM= ROM exercise group; 1) Fatigue, 2) Functional status, 3) Lupus disease activity and prednisone dose, 4) Cardiovascular fitness, 5) Isometric strength 6) Bone mineral density, | 1) Fatigue Severity Scale (FSS) 2) Short-Form 36 (SF-36) physical function scale 3) Systemic Lupus Activity Measure (SLAM) 4) Exercise treadmill, folowing the Naughton protocol with max. exercise in METS 5) Two lower extremity muscle groups (knee flexors and extensors): isokinetic exercise machine, the CYBEX 6) Bone densitometry measurements of lumbar spine and femoral neck (hip): QDR-2000 bone densitometer 7) Parathyroid hormone: IncStar N-tact PTH SP Kit Assay (iPTH IRMA) Osteocalcin: Metra | N=5 Mean age = 33.89 (range 24.16-49.88) | N=5 Mean age = 43.16 (range 19.11-64.23) | Patients in both exercise groups showed some improvement in fatigue, functional status, cardiovascular fitness, and muscle strength. Both groups showed increased bone turnover, but BMD was unchanged. *Baseline:* **SLAM**: IG AER: mean 4.40 range 1-12; IG ROM: mean 5.60 range 2-8. **METS**: IG AER: mean 8.82 range 6.3-11.5; IG ROM: mean 7.34 range 3.5-10.1. **FSS**: IG AER: mean 4.45 range 2.8-6.0; IG ROM: 4.73 range 4.4-5.2; **SF-36**: IG AER: mean 80.00 range 65-95; IG ROM: mean 73.00 range 55-100. **Muscle strength** (newton-meters) Hamstring (mean R and L): IG AER: mean 53.33 range 41.8-71.6; IG ROM: mean 41.87 range 29.7-60.8; Quadriceps (mean R and L): IG AER: mean 84.09 range 64.8-99-9; IG ROM: mean 74.79 range 45.9-109.3. **Bone density** (T-score): Lumbar %: IG AER: mean 93.80 range 75-112; IG ROM: mean 98.20 range 74-139; Hip %: IG AER: mean 93.60 range 79-108; IG ROM: mean 85.40 range 71-97. **Bone chemistries**: PTH | n.a. |

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		7) Bone biomechanical markers (Parathyroid hormone and osteocalcin)	Biosystems Novocalcin immunoassay (Metra Biosystems, Inc., Mountain View, CA)			(pg/ml): IG AER: mean 31.20 range 16-42; IG ROM: 25.80 range 5-67; Osteocalcin (mg/ml): IG AER: mean 3.32 range 1.6-4.6; IG ROM: mean 1.96 range 0.7-038. *Change Phase I – baseline:* **SLAM:** IG AER: mean -0.80 (95%CI) -2.78, 1.18, IG ROM: mean -0.80 (95%CI) -1.98, 0.38; **METS:** IG AER: mean 0.86 (95%CI) 0.48, 1.24; IG ROM: mean 0.47 (95%IC) -0.01, 0.96. **FSS:** IG AER: mean -0.78 (95%CI) -1.07, -0.49; IG ROM: mean -0.47 (95%CI) -1.26, 0.32. **SF:** IG AER: mean 10.0 (95%CI) 3.71, 16.29; IG ROM: mean 6.00 (95%CI) -12.94, 24.94; *Phase II – baseline:* **SLAM:** IG AER: mean 2.80 (95%CI) 0.90, 4.70; IG ROM: mean 0.40 (95%CI) -2.27,3.07. **METS:** IG AER: mean 0.64 (95%CI) -0.11, 1.39; IG ROM: mean 1.40 (95%CI) -4.68, 7.48. **FSS:** IG AER: mean -0.71 (95%CI) -1.23, -0 18; IG ROM: mean -0.68 (95%CI) -1.22, -0.13; **SF-36:** IG AER: mean 7.00 (95%CI) -4 80, 18.80; IG ROM: mean 2.5 (95%CI) -23.11, 28.11. **Muscle strength** (newton-meters) Hamstring (mean R and L): IG AER: mean 11.28 (95%CI) 3.31-19.24; IG ROM: mean 19.25 (95%CI) 8.63, 29.87; Quadriceps (mean R and L): IG AER: mean 12.21 (95%CI) -3.04, 27.46; IG ROM: mean 22.64 (95%CI) 13.44, 31.84. **Bone mineral density** (% T-score difference): Lumbar: IG AER: mean -0.20 (95%CI)-2.26, 1.86; IG ROM: mean -5.00 (95%CI) -15.00, 5.00; Hip: IG AER: mean 1.40 (95%CI) -7.43, 10.23; IG ROM: mean -0.75 (95%CI) -2.88, 1.38. **Bone chemistries**: PTH (pg/ml): IG AER: mean 6.60 (95%CI) -6.43, 19.63; IG ROM: mean 5.75 (95%CI) -7.45, 18.95; Osteocalcin (mg/ml): IG AER: mean -0.28 (95%CI) -0.92, 0.36; IG ROM: mean 0.90 (95%CI) 0.24, 1.56.	
Rannou, et al.[89]; 2016; RCT; France	SSc ♀ IG n=95 ♂ IG n=15 ♀ CG n=86 ♂ CG n=22	Physical therapy program; 1) Disability	1) Health assessment Questionnaire Disability Index (HAQ DI) score at 12 months	n=110 Mean age = 52.7 (±14.8)	n=108 Mean age = 53.1 (±14.4) Usual care	No differences in the primary outcome (adjusted between-group difference at 12 months -0.01 [95% CI -0.15, 0.13]; p=0.86); at 1 month significant, (HAQ DI between-group difference -0.14 [95% CI -0.24, -0.03]; p=0.01); at 6 months not significant -0.12 (95% CI -0.23, 0.01); p=0.054).	2 patients reported fatigue during the supervised program, 1 patient reported hip pain after aerobic exercise, and 1 patient reported calf pain 5 days after the end of the supervised program.
Reis and Trevisani[90]; 2014; study protocol, Brazil	SLE	Aerobic exercise; 1) Improving Sleep	1) Sleep efficiency will be evaluate with actigraph, the Pittsburgh Sleep Quality Index (PSQI)	n.a.	n.a.	n.a.	n.a.

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Reis-Neto, et al. [91]; 2013; quasi-experimental study; Brazil	SLE ♀ IG n=23 ♀ CG n=21	Supervised physical exercise; primary outcome was not specified, 1) Endothelial function 2) Ergospirometric test variables 3) Disease activity	1) Flow-mediated dilation (FMD) 2) Ergospirometry 3) disease activity (SLEDAI)	n=23 Mean age = 35.3 (±6.8)	n=21 Mean age = 30.8 (±7.2) No intervention.	1) 16 weeks increase FMD IG [pre 6.3 (6.7)%, post 14.1 (9.1)%, p=0.006], no increase CG [pre 8.4 (8.2)%, post 9.4 (5.7)%, p=0.598]; between groups IG significant increase [pre 7.8 (8.8)%, post 1.1 (8.8)%, p=0.026]. 2) ergospirometric test, IG improvement in exercise tolerance [pre 12.3 (2.4), post 13.4 (2.6) min, p=0.027], maximum speed [pre 7.7 (1.0), post 8.3 (1.2) km/h, p=0.027] and threshold speed [pre 5.6 (0.7), post 6.1 (0.9) km/h, p=0.005] no differences in CG. IG significant increase exercise tolerance to CG: [pre 1.1 (1.8), post -0.2 (1.6) min, p=0.026], maximum speed [pre 0.6 (1.0), post -0.1 (0.8) km/h, p=0.019] and VT1 speed [pre 0.5 (0.5), post -0.2 (0.6) km/h, p=0.002] compared with the CG at the end of 16 weeks. There 3) no difference in the SLEDAI score in both groups: IG [mean (S.D.) pre 2.0 (2.1), post2.4 (2.3), p=0.196] or in the CG [pre 2.4 (2.3), post 3.1 (5.3), p=0.833], between groups at T16 (P = 0.652)	Not reported in the article.
Rimmer, et al. [92]; 2013; RCT; USA	SLE ♀ IG n=44 ♂ IG n=15 ♀ CG n=25 ♂ CG n=7	Personalized Online Weight and Exercise Response System (POWERS); 1) Weight management	1) Body weight, kg	POWERS n=32 Mean age = 46.2 (±14.0) POWERSplus n=27 Mean age = 44.3 (±12.8)	n=32 Mean age = 48.8 (±11.1) Recommendation to exercise from physician	In this study, patients with different diseases were investigated. Since no subgroup analyses were presented in the article, the effectiveness findings refer to a mixed population, which makes a conclusion related to people with SLE only impossible. Post-intervention differences in body weight were found between the groups. There was a significant group x time interaction (P G 0.01) in post-intervention body weight, with both the POWERS and POWERSplus groups demonstrating greater reduction in body weight compared with the control group (POWERS: -2.1 ± 5.5 kg, -2.4 ± -5.9%; POWERSplus: -0.5 ± 5.0 kg, -0.6 ± 4.3%; control: +2.6 ± 5.3 kg, 3.1 ± 7.4%).	No adverse events have occurred.
Sahebalzamani, et al. [93]; 2016; one-group pretest–post test design; Iran	SLE ♀ IC n=32 ♂ IG n=2	Continuous care model (CCM); 1) Knowledge Scores (patient's knowledge and patient's perception of family awareness and knowledge)	1) Self-developed questionnaire	n=34 Mean age = 37.64 (±12.77)	n.a.	Continuous care model significantly improved patients' knowledge level and their perceptions of their family members' awareness of their disease. Patients' knowledge, mean (±SD): Pre-intervention 3.02 (±5.31), Post-intervention 26.85 (±14.18), mean difference (95% CI) 23.82 (18.84–28.80), ES 0.742, p<0.001 Families' awareness (Patients' perception), mean (±SD): Pre-intervention 15.91 (±7.04), Post-intervention 22.64 (±4.84), mean difference (95% CI) 6.73 (4.30–9.16), ES 0.492, p<0.001	Not reported in the article.
Samuelson and Ahlmén [94]; 2003; series of	SSc ♀ IG n=6	Patient education program; 1) Self-efficacy	1) Swedish version of the Arthritis Self-Efficacy Scale (ASES)	n=6 Mean age = 62 (range 47–74)	n.a.	ASES: small number of study subjects did not permit a proper statistical analysis. The SEP of 3 patients with obvious pain at baseline was higher at the end of the course, indicating improvement. The SEF scores seemed stable. An increase in perceived self-efficacy to cope with	Not reported in the article.

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single-case studies; Sweden						physical and psychological symptoms of the disease, SEOS, was noted in 5 patients, while the sixth patient had excellent scores from the start.	
Sandqvist, et al. [95]; 2004; RCT; Sweden	SSc ♀ IG n=15 ♂ IG n=2 (CG was the other hand of the same subjects)	Paraffin bath in combination with hand exercises; 1) Function	1) Range of motion (ROM; Extension deficits of digits II –V; volar abduction of the thumb; Finger flexion deficit of digits II –V)	n=17 Median age = 53 (range 30-66)	n=17 (=the other hand of the same subjects) Hand exercises only	1-month follow-up, finger flexion and extension, thumb abduction had improved in the paraffin-treated hand compared with the baseline values (p=0.05) independent of skin score and disease; a statistically significant change in the group as a whole was obtained for finger flexion only (p=0.046). 1) Finger flexion deficit1 (digits II –V, mm, median [range]): Baseline 30 (12.5 – 80); 1 month 22.5 (5 – 56.3); p<0.01 Finger extension deficit (digits II –V, mm, median [range]): Baseline 6.3 (0 – 35); 1 month 5 (0 – 31.3); p<0.01 Thumb abduction (mm, median [range]): Baseline 140 (100 – 165); 1 month 140 (105 – 170); p<0.05	Not reported in the article. Some patients had a worse outcome in some joints.
Schouffoer, et al. [96]; 2011; RCT; Netherlands	SSc[*] ♀ IG n=19 ♀ CG n=21 ♂ IG n=9 ♂ CG n=4	Multidisciplinary team care program; primary outcome was not specified. 1) Body function 2) Functional ability 3) Quality of Live	1) Hand Mobility in Scleroderma (HAMIS) test, Jamar dynamometer, maximal mouth opening (MMO), 6-minute walk distance (6MWD), maximum aerobic capacity (VO2max), Checklist Individual Strength 20 (CIS-20) 2) Health Assessment Questionnaire (HAQ) 3) Short Form Health Survey 36 (SF-36)	n=28 Mean age = 53.9[€]	n=25 Mean age = 51.7 Usual care	IG at 12 weeks improvement in grip strength (2.2 versus -1.8 kg; p=0.001), MMO (1.4 versus -0.9 mm; p=0.011), 6MWD (42.8 versus 3.9 meters; p=0.021), and HAQ score (-0.18 versus 0.13; p=0.025) other outcome measures did not reach significance **12 weeks (mean change) IG**: improvement of grip strength (IG 2.2 [95% 0.6, 3.8], CG -1.8 [-3.4, -0.1], p=0.001), MMO (IG 1.4 [95% 0, 2.8], CG -0.9 [-2.1, 0.5], p=0.011), 6MWD (IG 42.8 [95% 22.1, 63.6], CG 3.9 [-20.8, 28.5], p=0.021), and the HAQ (IG -0.18 [95% -0.36, -0.01], CG 0.13 [-0.02, 0.27], p=0.025) **24 weeks (mean change) IG:** MMO (IG 1.4 [95% -0.3, 3.0], CG -0.4 [-1.5, 0.7], p=0.004)	IG 2 patients: progressively painful skin in 3 weeks; Achilles tendon rupture during the circuit training in the second week
Sheffield Hallam University [97]; 2019, study protocol, UK	SSc	Arm cranking, cycling; 1) Part I Mikcrocirculation in the digital area 2) Part II (Feasibility study): Feasibility of a combined exercise protocol (aerobic with resistance training) 3) Part II (Feasibility study) Assessment of Quality time	1. Microcirculation will be assessed via the combination of iontophoresis and laser doppler fluximetry in order to assess the microvascular reactivity pre and post the exercise intervention in the digital area. 2. The feasibility of the exercise protocol will be assessed via the acceptability of the exercise protocol which will be measured with certain questionnaires, individual experiences from the exercise sessions and compliance criteria 3. QoL with a modified version of EQ-5D-5L questionnaire, 6 minute-walking test will assess the functional capacity to perform daily activities and individual experiences (interviews)	n.a	n.a	n.a	n.a

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Sheikh, et al. [98]; 2019; one-group pretest–post test design; USA	SLE ♀ IG n=45 ♂ IG n=3	Walk with Ease (WWE); no primary outcome specified; 1) Pain 2) Stiffness 3) Fatigue	1) – 3) Visual Analogue Scale (VAS) 3) The Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-fatigue)	n=48 Mean age = 44.7 (±14.3)	n.a.	At 6 weeks, 48 of the 75 recruited participants completed the WWE program. Participants experienced modest improvements in stiffness and fatigue (ES=0.12 and ES=0.23, respectively, for VAS scores; ES=0.16 for FACIT-fatigue score). FACIT-fatigue: baseline 27.86 (29.34), follow up 32.81 (30.36), ES 0.16 (-0.24, 0.57) VAS Fatigue: baseline 49.54 (71.03), follow up 33.35 (71.00), ES 0.23 (-0.19, 0.64) VAS Pain: baseline 32.98 (54.85), follow up 29.28 (54.37), ES 0.07 (-0.34, 0.47) VAS Stiffness: baseline 41.66 (67.12), follow up 33.52 (65.53), ES 0.12 (-0.28, 0.53)	Not reported. 27 patients were non-completers.
Sohng [99]; 2003; quasi-experimental study; South Korea	SLE ♀ IG n=21 ♀ CG n=20	Self-management course; primary outcome was not specified, 1) Fatigue 2) Coping skills 3) Self-efficacy 4) Depression 5) Pain 6) Disease activity.	1) Multidimensional Assessment of Fatigue scale (MAF) 2) Numerical rating scales from 1 to 10 (NRS) 3) Numerical rating scales from 1 to 10 (NRS) 4) Beck Depression Inventory (BDI) 5) Visual analogue scale (VAS) 6) C3, C4, and anti-dsDNA antibody in mg/dL measured by nephelometry.	n=21 Mean age = 32.9 (±11.8)	n=20 Mean age = 32.3(±10.9) No intervention.	1) Fatigue: significant improvement in fatigue (p=0.049): IG decreased from 27.7 (±10.3) to 24.8 (±10.4) after the intervention, CG increased from 21.7 (±9.6) to 24.5 (±10.1) 2) Coping skills: significant improvement (p=0.007), IG pre-intervention 65.2 (±19.8) and 68.2 (±20.3) after the intervention; CG decreased from 71.7 (±16.1) to 68.6 (±16.3) 3) Self-efficacy (p=0.001), IG increase from 40.2 (±10.0) to 44.8 (±10.8); CG from 42.5 (±7.5) to 43.1 (±7.7) 4) Depression (p=0.025), IG decrease from 12.8 (±9.1) to 11.1 (±9.0); CG increased from 8.3 (±7.3) to 10.9 (±5.0) 5) Pain not significant (p=0.469), IG from 2.1 (±2.2) to 2.2 (±0.6), CG from 8.3 (±7.3) to 10.9 (±4.0) 6) Disease activity not significant.	Not reported in the article.
Tench, et al. [100]; 2003; RCT; UK	SLE ♀ IG (EX) n=33 ♀ IG (RX) n=29 ♀ CG n=32 Mean age$^{\lor}$ = 39 (±0.8)	graded aerobic exercise programme (exercises [EX], relaxation [RX]); 1) Fatigue	1) Self-rated clinical global impression change score, 7 levels	(EX) n=33 (RX) n=29	n=32 No intervention	16 of the 33 (49%) patients in the EX rated 'much' or 'very much' better compared to 8 of 29 (28%) in the RX and 5 of 32 (16%) in the CG (x2=8.3, df=2, P=0.02).	No flare in disease activity, no serious adverse events
Thombs, et al. [101], 2018; study protocol, Canada	SSc	SPIN-SSLED Program 1) Participant Feedback on Usability of Program Materials 2) Participant Feedback on Ease of Use of the Go-To	1) Participants Interviews 2) Participants Interviews 3) Participants Interviews 4) Time logs 5) the number presented represents the total time required	n.a	n.a	n.a	n.a

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		Videocon-ferencing Program 3) Participant Feedback on Ease of Use of the Online Forum 4) Personnel Requirements 5) Duration of Management of Online Training Group Participation 6) Percentage of Topics Adequately Covered in the Sessions 7) Number of Participants That Reported no Technological Problems	6) observation of entire sessions for a randomly selected sample of 25% of video-recorded sessions. Adherence to session's goals and content using a checklist coding systems based on a standardized format. 7) Log of technological problems maintained and reported				
Timóteo, et al. [102]; 2018; quasi-experimental study; Brazil	SLE ♀ IG n=5 ♀ CG n=9	Kinesiotherapy; primary outcome was not specified, 1) Functional capacity (posture, anthropometry, quality of life, strength, flexibility, walking and balance) 2) Quality of life 3) Serum levels of immune system markers	1) Posture chart, height, body mass, skin folds, Tinetti gait and balance evaluation test, Sanny fleximeter, Wells test, 10 maximal repetitions test (10 RM) 2) Medical Outcomes Study 36 questionnaire (SF-36 short health survey form) 3) Blood collection and determination of cytokine levels, PI, and numbers of CD11b+ and CXCR2+ neutrophils and lymphocytes	n=5 Median age = 38.0 (IQR 30.0–41.5)	n=9 Median age = 45.0 (IQR 31.5–52.0) usual care	Increases of flexibility and strength, as well as a reduction in pain, kinesiotherapy did not influence immune parameters. 1) Bench press (kg), median (IQR): CG pre 10.0 (7.0–12.0), post 12.0 (9.0–12.0), p=ns; IG pre 8.0 (7.5–8.0), post 20.0 (12.0–24.0), p=0.068 Leg extensions (kg), median (IQR): CG pre 20.0 (10.0–26.0), post 19.0 (11.5–24.0), p=ns; IG pre 11.0 (7.0–18.0), post 21.0 (19.0–33.0), p=0.062 Lying legs curls (kg), median (IQR): CG pre 7.0 (5.0–8.0), post 5.0 (4.0–9.0), p=ns; IG pre 3.0 (2.0–11.0), post 12.0 (11.0–14.0), p=0.062 Wells test (cm), median (IQR): CG pre 7.5 (5.0–22.5), post 10.0 (3.0–17.25), p=ns; IG pre 19.0 (2.5–20.0), post 27.0 (11.0–35.25), p<0.001 Right hamstring stretching test (degree) median (IQR): CG pre 75.0 (51.0–71.25), post 62.5 (57.5–71.25), p=ns; IG pre 65.0 (47.5–77.0), post 65.0 (47.5–77.0), p=ns Left hamstring stretching test (degree), median (IQR): CG pre 67.5 (53.74–75.0), post 65.0 (52.0–75.0), p=ns; IG pre 80.0 (65.0–85.0), post 80.0 (65.0–86.0), p=ns	Not reported in the article.

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						Pectoral strength test (degree), median (IQR): CG pre 30.0 (13.75–32.5), post 30.0 (17.40–40.0), p=ns; IG pre 20.0 (10.0–37.5), post 25.0 (17.5–40.0), p=ns 2) Physical functioning, median (IQR): CG pre 65.0 (60.0–87.5), post 72.50 (48.75–92.5), p=ns; IG pre 70.00 (40.0–82.5), post 80.00 (49.0–90.0), p=ns Role physical, median (IQR): CG pre 100.0 (37.5–100.0), post 50.0 (12.5–87.5), p=ns; IG pre 25.0 (0.0–87.5), post 100.0 (50.0–100.0), p=ns Bodily pain, median (IQR): CG pre 61.0 (28.25–68.0), post 42.0 (20.5–73.0), p=ns; IG pre 52.0 (20.5–74.0), post 84.0 (59.0–100.0), p=0.02 General health, median (IQR): CG pre 57.0 (39.5–92.0), post 65.0 (38.5–82.0), p=ns; IG pre 52.0 (30.0–68.5), post 65.0 (48.5–81.0), p=ns Vitality, median (IQR): CG pre 40.0 (30.0–50.0), post 40.0 (31.25–45.0), p=ns; IG pre 45.0 (17.5–82.0), post 60.0 (35.0–78.0), p=ns Social functioning, median (IQR): CG pre 62.5 (37.5–75.0), post 62.5 (43.75–75.0), p=ns; IG pre 50.0 (31.25–93.75), post 62.50 (18.75–100.0), p=ns Role emotional, median (IQR): CG pre 33.3 (0.0–100.0), post 66.6 (0.0–100.0), p=ns; IG pre 66.6 (0.0–100.0), post 100.0 (16.65–100.0), p=ns Mental health, median (IQR): CG pre 52.00 (34.0–70.0), post 48.0 (32.0–69.0), p=ns; IG pre 64.0 (38.0–84.0), post 72.0 (36.0–88.0), p=ns 3) IL-2, median (IQR): CG pre 7.20 (6.75–8.95), post 0.0 (0.0–0.0), p=ns; IG pre 12.80 (5.60–21.45), post 0.0 (0.0–0.0), p=ns IL-5, median (IQR): CG pre 4.0 (2.50–10.50), post 0.0 (0.0–0.0), p=0.003; IG pre 5.10 (2.95–10.60), post 0.95 (0.21–1.92), p=ns IL-6, median (IQR): CG pre 6.90 (6.15–17.10), post 5.13 (2.47–6.07), p=0.007; IG pre 5.20 (2.60–7.35), post 1.30 (0.22–4.89), p=ns IL-8, median (IQR): CG pre 21.5 (11.95–46.5), post 10.20 (9.12–20.95), p=0.054; IG pre 21.10 (19.05–45.50), post 8.70 (7.13–179.9), p=ns IL-10, median (IQR): CG pre 16.10 (2.80–19.95), post 6.13 (3.22–9.50), p=0.034; IG pre d 4.90 (0.0–14.85), post 4.86 (0.17–16.03), p=ns TNF-a, median (IQR): CG pre 1.70 (0.0–3.27), post 0.0 (0.0–2.02), p=ns; IG pre 0.93 (0.35–3.60), post 0.12 (0.0–2.63), p=ns	
Twumasi, et al. [103]; Twumasi, et al. [104] 2020; qualitative study; USA	SLE ⚲ IG n=24	Chronic Disease Self-Management Program (CDSMP), primary outcome n.a.; 1) Self-management	1) Interviews	n=24 Mean age = 48.6 (±13.5)	n.a.	Study participants perceived the CDSMP to be a valuable resource that helped them improve self-management behaviors, including exercise, relaxation, diet, and medication adherence.	Not reported

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Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
Uras, et al. [105]; 2019; RCT; Italy	SSc ♀ IG n=32 ♀ CG n=31	Educational materials and a specific "face-to-face" interventions 1) Mouth opening	1) Mouth opening, cm	n=32 Mean age = 54.6 (±15.8)	n=31 Mean age = 55.2 (±13.3) Educational materials alone	Compared to baseline, IC mouth opening increased of 0.31 cm (95% confidence interval: 0.13–0.49), p=0.003; control group, the increase was 0.13 cm (95% confidence interval: 0.01–0.25), p=0.06; between the two groups was not statistically significant (p=0.10 [intention-to-treat analysis]; however, reached statistical significance in the per-protocol analysis (39 patients, p=0.02). Experimental group - mouth opening, cm (mean [±SD]): baseline 3.69 (±0.65), 12 months follow up 4.00 (±0.76), mean difference (95% CI) 0.31 (0.13–0.49) p=0.003, difference (95% CI) to control groupe 0.18 (−0.03 to −0.39) p=0.10 Control group - mouth opening, cm (mean [±SD]): baseline 3.48 (0.60), 12 months follow up 3.61 (0.65), mean difference (95% CI) 0.13 (0.01–0.25) p=0.06	Not reported
Vitali, et al. [106]; 2019; single case study; Italy	SSc ♀ IG n=4	Oral exercises; 1) Oral Motor functions	1) Maximal mouth opening (MMO) (distance between the incisal edge of the upper and lower first incisors); tongue protrusion (Tprot) (distance between the position of tongue at rest and maximum Tprot. subjects were asked to push the rod connected to the strain gauge dial as far as possible by the tongue); tongue strength (Tstren) (force exerted by the tongue); lip strength (Lstren) (force exerted by the lips)	n=4 Mean age = 56.5 (±14.6)	n.a.	The mean phase differences between assessment and treatment phases across subjects were from 0.88 to 9.56 mm in MMO, from 2.03 to 12.3 mm in Tprot, from −0.12 to 5.35 N in Tstren, and from −0.84 to 5.19 N in Lstren; 3 subjects crossed the 5th percentile discriminating normal from abnormal performances for both Tstren and Tprot, while this occurred in 2 subjects for MMO and Lstren.	Not reported
Williams, et al. [107]; Williams, et al. [108]; 2019; one-group pretest–post test design; USA	SLE ♀ IG n=20	Peer Approaches to Lupus Self-management (PALS); no primary outcome specified; 1) Quality of Life 2) Self-management 3) Disease activity	1) Lupus quality of life questionnaire (LUP-QOL) 2) Patient Activation Measure 3) Systemic Lupus Activity Questionnaire (SLAQ), immunologic evidence as Th1/Th2 cytokine balance	n=20 Mean age not reported	n.a.	statistically significant decreases in patient-reported disease activity and improved trends in patient activation or patient engagement in their disease and management. Other numbers not reported. Disease activity (SLAQ): baseline mean (95% CI) 28.2 (13.83–42.57), post-intervention (95% CI) 6.25 (5.20–7.30), p=0.004	Not reported
Williams, et al. [109]; 2017; one-group pretest–post test design; USA	SLE ♀ IG n=23	Peer Approaches to Lupus Self-Management (PALS) project; primary outcome was not specified, 1) PROs (self-management, Quality of Life, disease	1) Interviews; Patient Activation Measure (PAM); Lupus Quality of Life (LUP-QOL) questionnaire; Systemic Lupus Activity Questionnaire (SLAQ); along with standardized measures of stress (PSS), anxiety (GAD-7), and depression (PHQ-9). 2) Peripheral blood	23 Mean age 35+ Age <25 n= 2(8.7%), 25–34 n=2(8.7%), 35–44 n=8(34.8%), 45–54 n=5(21.7%), 55–64 n=1(4.4%), >65 n=5(21.7%);	n.a.	Strongest correlations were between the Generalized Anxiety Disorder measure and the Th1/Th2 cytokine balance. Weaker correlations existed between depression and the Th1/Th2 cytokine balance. Significant improvements in depression and anxiety and these variables were also significantly associated with improved cytokine balance.	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
		activity, stress, anxiety, depression) 2) Th1/ Th2 balance		mean age more than 35 years			
Williams, et al. [110]; 2016; study protocol; USA	SLE Protocol, not inclusions	Improve quality of life for African-American lupus patients (IQAN); 1) Self-management (health behaviors, health status, health care utilization, biological markers)	1) The Arthritis Self-Efficacy Scale (ASES), the Personal Health Questionnaire Depression Scale (PHQ-9), the Lupus Quality of Life Questionnaire (LUP-QOL), the Systemic Lupus Activity Questionnaire (SLAQ), and the Stanford Patient Education Research Center Questionnaires.	n.a.	n.a.	n.a.	n.a.
Wolff, et al. [111]; 2014; description of an intervention	SSc Not experimental	SMART framework for long term management of chronic hand conditions; confidence and the ability to self-management	n.a.	n.a.	n.a.	n.a.	n.a.
Wu, et al. [112]; 2019; RCT; Taiwan	SLE ♀ IG n=38 ♀ CG n=38	Physical activity counselling (The 5 A's model to improve physical activity in patients with SLE); no primary outcome specified; 1) Physical activity 2) Disease activity 3) Quality of Life 4) Fatigue 5) Sleep	1) Agoss Health Pedometer 2) Systemic Lupus Erythematosus Disease Activity Index-2000 (SLEDAI-2K) 3) 36-item Short Form Health Survey (SF-36) 4) Fatigue Severity Scale (FSS) 5) Pittsburgh Sleep Quality Index (PSQI)	n=38 Mean age = 43.76 (±9.92)	n=38 Mean age = 43.45 (±12.70) Usual care	Daily steps, quality of sleep, and vitality were significantly improved in the intervention group compared with the control group (at week 8 and 12), mental health at week 8. 1) Physical activity: baseline IG 5820 (±2430) steps, CG 5942 (2659); post intervention IG increased 1309 steps per day, CG 286; p<0.001 2) Disease activity: not reported 3) Quality of Life: Significant improvements in vitality at the eighth week (B = 7.20, P = .01) and 12th week (B = 9.15, P < .01) and mental health at the eighth week (B = 4.34, P < .05). No significant differences in other domains. 4) Fatique: not significant (B = −0.18, P = .47 and B = −0.14, P = 0.64) 5) Sleep: significant improvement from baseline to the eighth week and 12th week (B = −1.08, P < .01 and B = −1.24, P < 0.01)	Not reported
Xie, et al. [113]; 2018; RCT; China	SLE ♀ IG n=57 ♂ IG n=7 ♀ CG n=54 ♂ CG n=7	Transitional care (Omaha System); no primary outcome specified 1) Self-care 2) Quality of life	1) Exercise of Self-Care Agency Scale (ESCA) 2) Medical Outcomes Study Short Form 36-item Health Survey (SF-36)	n=64 Mean age = 35.9 (±12.3)	n=61 Mean age = 38.4 (±15.8) Usual care	IG greater improvement in self-care and quality of life. Self-care agency, total score, mean (SD): CG pre 95.7 (9.6); CG post 100.9 (8.5); IG pre 92.9 (10.8); IG post 112.9 (6.8); p< 0.001 Quality of life, SF-36 PCS, mean (SD): CG pre 50.0 (11.9); CG post 60.5 (12.3); IG pre 48.8 (12.4); IG post 63.7 (10.9); P=0.046 Quality of life, SF-36 MCS, mean (SD): CG pre 49.8 (13.1); CG post 57.4 (9.3); IG pre 45.4 (14.3); IG post 61.1 (9.1); P=0.001	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[+] Mean age (±SD)[ø]	n CG[+] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
Yelnik, et al. [114]; 2016; uncontrolled, longitudinal experimental study; USA	SLE ♀ IG n=108 ♂ IG n=13	Cardiovascular disease (CVD) prevention counselling program; 1) Prevalence of CVD risk factors	1) blood pressure, blood glucose, cholesterol profile, bodymass index (BMI), smoking, lifestyle habits (diet and physical activity).	n=121 Mean age = 41.4 (±13.7)	n.a.	Blood pressure no significant changes: odds ratio (OR) 1.00 (0.98–1.02); blood glucose no significant changes, percentage of patients with abnormal blood glucose significantly increased over time: OR 1.11 (1.08–1.15); cholesterol profile only mean HDL improved, Abnormal lipid profile (%) 0.99 (0.97–1.01), significant improvement in the number of patients with abnormal cholesterol profile (OR 0.90, 95% CI 0.92–0.96); BMI no significant changes: OR 1.03 (0.98–1.08); Smoking no significant changes: OR 0.94 (0.86–10.2); poor diet habits increased significantly: OR 0.94 (0.93–0.96); physical activity significantly decreased: OR 0.94 (0.92–0.96).	Not reported in the article.
Young, et al. [115]; 2002; survey; UK	SLE ♀ IG n=510 ♂ IG n=36	LupusHelp; 1) Patient information	1) Knowledge questionnaires	n=510 age range: 15-70	n.a.	510 participants completed an online questionnaire that showed that for some users it was their first use of the internet to gather lupus information, but the majority (58.9%) accessed it at least monthly for this purpose. We also found that, while most users (56.9%) found current disease information was at an appropriate level, 37.5% thought it was too basic. Knowledge questionnaires from 42 participants before and after using the site showed a significant rise in users' knowledge of the areas covered by the site.	n.a.
Yuen, et al. [116]; 2011; one-group pretest–post test design; USA	SLE ♀ IG n=15	Home-based exercise program; 1) Fatigue	1) Fatigue Severity Scale (FSS)	n=15 Mean age = 46.7 (±14.4)	n.a.	There was a significant reduction in fatigue at the post 10-week Wii Fit exercise assessment (FSS baseline [53.9±7.2]; T1 [44.0±11.2]; p=0.002).	No adverse events have occurred.
Yuen, et al. [117]; 2011; RCT; USA	SSc ♀ IG n=21 ♂ IG n=5 ♀ CG n=17 ♂ CG n=5	home orofacial exercise program; 1) Size of oral aperture	1) Change in the maximum oral aperture from baseline to the 3- and 6-months post	26 Mean age = 51.9 (±14.3)	22 Mean age = 49.2 (±11.4) Usual care	Significantly increase in oral aperture for participants received the orofacial exercise program was found when compared to those in the usual care at 3 months, but not at 6-months evaluation. Baseline-T1 (overall change; mean, ±SD; p-value): IG (1.44 ±2.83; within-group p=0.02); CG (−0.09 ±3.16; within-group p=0.71); between group p=0.04 Baseline-T2 (overall change; mean, ±SD; p-value): IG (2.14 ±2.88; within-group p=0.001); CG (2.26 ±4.28; within-group p=0.02); between group p=0.19	Not reported in the article.
Yuen, et al. [118]; 2011; RCT; USA	SSc (same patients as [117])	Adaptive oral hygiene devices and orofacial home-exercise; 1) Improve gingival health	1) Löe-Silness gingival index (GI)	(same patients as [117])	(same patients as [117]) Manual toothbrush (Oral-B® Complete Advantage	Change in the mean gingival index (GI) scores (whole mouth) 0–3 Months Entire Sample (IG 0.05, p<0.05; CG 0.14, p<0.05; Difference −0.09), Subgroups with Oral Aperture < 40 mm (IG 0.08, p<0.05; CG 0.08, p<0.05; Difference 0.00)) 0–6 Months Entire Sample (IG 0.12, p<0.05; CG 0.06, p<0.025; Difference 0.07, p<0.025), Subgroups with Oral Aperture < 40 mm (IG 0.16, p<0.05; CG −0.02; Difference 0.18, p<0.025)	Not reported in the article.

Study; Year; Design; Country	Population	Intervention; Primary Outcome	Measurement	n IG[‡] Mean age (±SD)[ø]	n CG[‡] Mean age (±SD)[ø] Control intervention	Results	Adverse effects
					Deep Clean toothbrush) and dental floss (Crest® glide shred guard floss)	Both groups showed significant reduction in GI scores at 6 months (P<0.005). Reduction in GI scores of the intervention group at 6 months was 20.8% which is considered to be clinically significant. Compared to the control group, the intervention group showed a significant and larger reduction in GI score by 8% at 6 months (P=0.0007).	
Zanatta, et al. [119]; 2017; quasi-experimental study; Italy	SSc ♀ IG n=10 ♀ CG n=10 Mean age[∀] = 50.8 (±9.6)	Occupational therapy; 1) Activities of daily living	1) Health assessment questionnaire (HAQ); Evaluation of Daily Activity Questionnaire (EDAQ)	n=10	n=10 Information meeting	T0-T1 comparison: lower HAQ score, though this was not statistically significant, the total score of the EDAQ significantly decreased (p<0.05). Comparing the two groups of women, both the HAQ and the EDAQ scores significantly improved in the occupational therapy group (p<0.05). HAQ mean±SD (IG T0 [14.9±11.3]; T1 [11.8±7.1]; CG T0 [13.3±13.1]; T1 [13.9±13.5]; between groups p<0.05) EDAQ total mean±SD (CG T0 [66.7±42.9]; T1 [50.3±33.5]; CG T0 [72.4±73.0]; T1 [71.5±72.3]; between groups p<0.05)	Not reported in the article.

[ø]SD = Standard deviation
[ϵ]SD not reported
[$]RCT = Randomised Controlled Trial
[*]SSc = Systemic Scerlosis
[£]SLE = Systemic Lupus Erythematosus
♂ = male
♀ = female
[‡]IG and CG = Intervention-group and Control-group
[α]No effect-sizes in the study reported
[Ω]Gender distribution per group not reported
[¥]n.s. = not significant
[Π]SF-36 v2 Health Survey (Mental component summary, Physical component summary)
[◁]ES=Effect size Cohen's d
[∀]mean age was only reported for all patients
[①]Both groups were intervention groups. Comparison between two different interventions.
[②]Number of SLE patients not reported

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