Supplementary materials

Table S1. Heart failure self-management intervention.

Study	Title	Country	Sample size (n)	Setting	Intervention Group	Control Group	Result
Aghamohammadi et al., 2019[20]	Effect of a self-management program on the health status of elderly patients with heart failure: a single-blind, randomized clinical trial	Iran	45 controls group 45 interventions group	Hospital	Self-management program	Usual care	a significant difference in mean scores of health status between the two groups (P=0.001). A self-management program can help with various health issues (except in the subscale of signs and symptoms).
Deek et al., 2017[21]	An evaluation of involving family caregivers in the self-care of heart failure patients on hospital readmission: Randomised controlled trial (the FAMILY study)	Lebanon	130 controls group 126 interventions group	Hospital	The FAMILY study	Usual care	There are significant between-group differences in favor of the intervention group for the maintenance and confidence sub-scales but not for the management sub-scale.
Athilingam	A Mobile	United	9 controls	Hosp	6 features	HF	There was a

et al., 2017[12]	Health Intervention to Improve Self-Care in Patients With Heart Failure: Pilot Randomized Control Trial	States	group 9 interventions group	ital	of the HeartMapp	education in HeartMapp	change in the mean score on self-care management (2 points) (8 points).
Amaritakomol et al., 2019[22]	Enhancing Knowledge and Self-Care Behavior of Heart Failure Patients by Interactive Educational Board Game	Thailand	38 controls group 38 interventions group	Hospital	Educational board game	Usual educational	The intervention group's knowledge and self-care behaviors significantly improved (p<0,001).
Koehler et al., 2018[23]	Efficacy of telemedical interventional management in patients with heart failure (TIM-HF2)	Germany	775 controls group 796 interventions group	Hospital	Remote patient management	Usual care	The differences in mortality from cardiovascular causes and quality of life between the remote patient management and usual care groups were not statistically significant.
Meng et al., 2016[24]	The impact of a self-management patient education	Germany	245 controls group, 43 clusters 268	Clinic	Self-management educational program	Basic educational	there was a significant small between-group

	program for patients with chronic heart failure undergoing inpatient cardiac rehabilitation		interventions group, 45 clusters				intervention effect on specific aspects of patients' self-management competence (self-monitoring and insight) ($p<0.005$).
Chen et al., 2018[25]	Motivational interviewing to improve the self-care behaviors for patients with chronic heart failure: A randomized controlled trial	China	33 controls group 29 interventions group	Hospital	Motivational interviewing	Conventional health education	There was a significant difference in improvements in self-care behavior scores between the two groups ($P <0.01$).
Shahrbabaki et al., 2012[26]	Effect of self-care education on patients' knowledge and performance with heart failure	Iran	40 controls group 40 interventions group	Hospital	Four educational sessions and a booklet	Usual care	The intervention group's rate of change was substantially higher than the control group's ($p<0.0001$). The case group's drug performance was significantly higher

							than the control group's ($p<0.0001$).
Jung-Hua Shao & Su-Hui Chen, 2018[27]	Randomized control trial of a self-management intervention for heart failure older adults in Northern Taiwan	Taiwan	60 controls group 60 interventions group (patients) 55 interventions group (patients and caregiver)	Hospital	Self-management program	Usual care	The heart failure self-management program considerably reduced patients' symptoms. However, there were no improvements in self-efficacy for salt and fluid control. No significant variations in intervention effects were found in patients with and without caregiver involvement.
Ming-Ya Hsu et al., 2021[28]	The effects of a self-regulation program on self-care behavior in patients with heart failure: A randomized controlled trial	Taiwan	41 control group 40 intervention group	Hospital	Self-regulation program	Usual care	After four weeks of the self-regulation program, the intervention group reported improvements in self-care behaviors,

							including self-maintenance and self-confidence subscale scores.
Mizukawa et al., 2019[29]	Nurse-Led Collaborative Management Using Telemonitoring Improves Quality of Life and Prevention of Rehospitalization in Patients with Heart Failure A Pilot Study	Japan	19 control group 18 self-management intervention group 20 collaborative management intervention group	Hospital	Self-management program and Collaborative program with telemonitoring	Usual care	In terms of self-efficacy and self-care, there were no significant differences between the three groups. However, only the Collaborative Management group had significant changes in self-efficacy and self-care (P<0.01).
Flores et al., 2020[30]	Effect of motivational interviewing on self-care of people with heart failure: a randomized clinical trial	Brazil and Uruguay	59 control group 59 intervention group	Clinic	Motivational interviewing	Usual care	Compared to traditional follow-up, motivational interviewing had a medium effect on maintenance and management (Cohen's

							d=0.6723; 0.5086) and a high effect on self-care confidence (Cohen's d=0.9877).
Chen et al., 2019[31]	Post-discharge short message service improves short-term clinical outcome and self-care behavior in chronic heart failure	China	260 control group 252 SMS intervention group 255 STS intervention group	Hospital	Receive SMS and structured telephone support (STS)	Usual care	There was no difference between the two groups. However, the SMS and STS groups reported greater self-care behavior than the control group (p = 0.013). At 180 days, the three groups had identical quality-of-life scores (P = 0.526).
Boyde et al., 2018[32]	Self-care educational intervention to reduce hospitalizations in heart failure: A randomized controlled trial	Australia	100 control group 100 intervention group	Hospital	Multimedia educational intervention	Usual educational	Self-care confidence scores increased significantly in the intervention group (p=0.015) but not in the control group (p=0.267) at baseline,

							three months, and twelve months. Scores in the intervention group improved from baseline to 3 months (p=0.003) and from baseline to 12 months (p=0.002).
Sezgin et al., 2017[10]	The effect on patient outcomes of a nursing care and follow-up program for patients with heart failure: A randomized controlled trial	Turkey	45 control group 45 interventio n group	Hosp ital	Educationa l booklet	Standard care	There was a statistically significant difference in self-care and quality of life scores between the intervention and control groups at three and six months. At three months, the intervention group had fewer rehospitaliz ations, but no significant differences were identified at six months.
Van Spall et al.,	Effect of Patient-	Canada	1390 control	Hosp ital	nurse-led self-care	Usual care	At 3 months or

2019[33]	Centered Transitional Care Services on Clinical Outcomes in Patients Hospitalized for Heart Failure The PACT-HF Randomized Clinical Trial		group 10 Clusters propensity-matched to the intervention group 1260 intervention group 10 Clusters randomized to the intervention group		education		30 days, there was no significant difference between the intervention and usual care groups in the primary composite outcomes.
Wonggom et al., 2020[34]	Effectiveness of an avatar educational application for improving heart failure patients' knowledge and self-care behaviors: A pragmatic randomized controlled trial	Australia	19 control group 17 intervention group	Hospital	Avatar educational App	Usual care (booklet)	At 30 and 90 days, there was no significant difference in self-care management scores across the groups. Only the intervention group showed improvement in self-care management after 30 and 90 days.
Creber et al., 2017[35]	Motivational interviewing to improve self-care for patients with chronic	America	26 control group 41 intervention group	Hospital	Motivational interviewing	Usual care	Motivational Interviewing is used in a novel nurse-led behavioral intervention to help

	heart failure: MITI-HF randomized controlled trial						patients with Heart Failure improve their self-care.
Hale et al., 2016[36]	A Remote Medication Monitoring System for Chronic Heart Failure Patients to Reduce Readmissions: A Two-Arm Randomized Pilot Study	USA	16 control group 13 intervention group	Hospital	The MedSentry medication monitoring	Usual care	The MedSentry medication monitoring device is a low-cost way to monitor medication adherence in heart failure patients remotely.
Ding et al., 2020[37]	The Effects of Telemonitoring on Patient Compliance With Self-Management Recommendations and Outcomes of the Innovative Telemonitoring Enhanced Care Program for Chronic Heart Failure: Randomized	Australia	93 control group 91 intervention group	Hospital	ITEC-CHF (innovative telemonitoring enhanced care program for heart failure)	Usual care	Although the withdrawal rate was high, ITEC-CHF increased participant compliance with weight monitoring.

	Controlled Trial						
Young et al., 2016[38]	Effects of a home-based activation intervention on self-management adherence and readmission in rural heart failure patients: the PATCH randomized controlled trial	USA	51 control group 51 intervention group	Hospital	(Patient AcTi-voted Care at Home [PATCH])	Usual care	The PATCH intervention increases behavioral activity and Self-Management compliance without reducing the incidence of rehospitalization
Dionne-Odom et al., 2020[39]	Effects of a Telehealth Early Palliative Care Intervention for Family Caregivers of Persons With Advanced Heart Failure	USA	76 control group 82 intervention group	Clinic	Telephone follow-up	Usual care	When compared to 16 weeks of standard treatment, the nurse-led early palliative care telehealth intervention (ENABLE CHF-PC) showed no significant improvements in quality of life, mood, or burden.
Vellone et al., 2020[40]	Motivational interviewing to improve self-care in heart failure	Italy	80 control group 80 intervention group (MI only	Hospital	Motivational interviewing	Usual care	MI conducted by a large group of trained nurses successfull

	patients (MOTIVATE-HF): a randomized controlled trial		for patients) 80 intervention group (MI for patients and caregivers)				y increased the self-care of individuals with heart failure substantially.
Haena et al., 2021[13]	Effects of a web-based education program for nurses using medical malpractice cases: a randomized controlled trial	Korea	61 control group 61 intervention group	Hospital	web-based educational program	Usual care	After the intervention, there are differences between the intervention group and the control group in terms of legal responsibilities, cognition, safety skills, and patient safety.
Jurgens et al., 2013[41]	Heart failure symptom monitoring and response training	USA	51 control group 48 intervention group	Hospital	HF SMART intervention	Usual care	Self-care maintenance and management were significantly improved in the usual care group (both p 0.01).
Sezgin et al., 2017[10]	The effect on patient outcomes of a nursing care and follow-up program for	Turkey	45 control group 45 intervention group	Hospital	Educational booklet	Usual care	There was a statistically significant difference in self-care and quality of life

	patients with heart failure: A randomized controlled trial						scores between the intervention and control groups at three and six months. At three months, the intervention group had fewer rehospitalizations, but no significant changes were identified at six months.
Liu et al., 2018[11]	Effects of a multidisciplinary disease management program with or without exercise training for heart failure patients: Secondary analysis of a randomized controlled trial	Taiwan	70 control group 70 intervention group (multidisciplinary disease management program without exercise training) 71 multidisciplinary disease management program with ex-ercise training	Hospital	multidisciplinary disease management program without and with exercise training	Usual care	Only the multimodal disease management program with exercise training improved 6-min walking distance significantly ($p<0.05$).
Chew et al., 2021[42]	Effectiveness of a nurse-led temporal	Singapore	72 control group 72 interventio	Hospital	Self-regulation interventio n	Usual care	Both groups increased their

	self-regulation theory-based program on heart failure self-care: A randomized controlled trial		n group				SCHFI maintenance scores at T1 and T2. The intervention group's improvement score was substantially greater than the control group's. After Bonferroni correction, the findings at T2 were insignificant.
Jiang et al., 2021[43]	The effectiveness of a nurse-led home-based heart failure self-management program (the HOM-HEMP) for patients with chronic heart failure: A three-arm stratified randomized controlled trial	Singapore	72 control group 71 intervention group A: received HOM-HEMP intervention 70 intervention group B: received the HOM-HEMP intervention and an additional smartphone app	Hospital	Management program (the HOM-HEMP)	Usual care	Patients in either intervention group A or group B scored substantially higher on the symptom control at all post-intervention follow-ups. They maintained cardiac self-efficacy subscales than participants in the control group.

Hwang et al., 2020[44]	Effects of an educational intervention on heart failure knowledge, self-care behaviors, and health-related quality of life of patients with heart failure: Exploring the role of depression	South Korea	213 control group 202 intervention group 1 198 intervention group 3	Hospital	Educational season and follow up via telephone	Usual care	Heart failure knowledge and self-care increased due to the educational intervention, but HRQOL did not. In individuals with depressive symptoms, no intervention effects were found.
Cajanding., 2016[45]	The Effectiveness of a Nurse-Led Cognitive–Behavioral Therapy on the Quality of Life, Self-Esteem and Mood Among Filipino Patients Living With Heart Failure: a Randomized Controlled Trial	Philippines	48 control group 52 intervention group	Hospital	Nurse-led cognitive-behavioral intervention	Usual care	Participants in the intervention group had significant improvements in their quality of life, self-esteem, and mood ratings after the 12-week intervention compared to those who received only standard care.
Sahlin et al., 2021[46]	Self-care Management Intervention	Sweden	62 control group 62 interventio	Hospital	Home-based tool OPTILOGG	Usual care	A significant improvement in event-

	in Heart Failure (SMART-HF): A Multicenter Randomized Controlled Trial		n group				free survival and a considerable reduction in unplanned hospital visits due to heart failure was reported using the mHealth tool.
Koehler et al., 2011[47]	Impact of Remote Telemedical Management on Mortality and Hospitalizations in Ambulatory Patients With Chronic Heart Failure	Germany	356 control group 354 intervention group	Hospital	Telemedical management group	Usual care	The Telemedical Interventional Monitoring in Heart Failure (TIM-HF) study found no reduction in mortality when remote telemedical management (RTM) was used on stable, appropriately managed chronic heart failure patients.
Margareta Brännström and Kurt Boman, 2014[48]	Effects of person-centered and integrated chronic	Sweden	36 control group 36 intervention group	Clinic	Palliative advanced home caRE and heart FailurE	Usual care	In outpatient polyclinics, hospitals, and primary health

	heart failure and palliative home care. PREFER: a randomized controlled study				caRe (PREFER)		centers, there were substantial disparities in the use of visits and telephone calls and doctor and nurse prescriptions between the PREFER and normal care groups.
Ong et al., 2016[49]	Effectiveness of Remote Patient Monitoring After Discharge of Hospitalized Patients With Heart Failure The Better Effectiveness After Transition–Heart Failure (BEAT-HF) Randomized Clinical Trial	California	722 control group 715 intervention group	Hospital	Redischarge HF education, regularly scheduled telephone coaching, and home telemonitoring	Usual care	The BEAT-HF study showed that combining remote patient monitoring with care transition management did not reduce all-cause readmission following heart failure hospitalization by 180 days.
Rogers et al., 2017[50]	Palliative Care in Heart Failure The PAL-	California	75 control group 75 intervention group	Hospital	Usual care plus a palliative care interventio	Usual care	During the 6-month follow-up, 30% of patients

	HF Randomized, Controlled Clinical Trial				n		were admitted to the hospital with heart failure, and 29% died. During the 6-month follow-up period, no differences between the two therapy groups were seen in any of these clinical endpoints.
Zan et al., 2015[51]	Patient Engagement With a Mobile Web-Based Telemonitoring System for Heart Failure Self-Management: A Pilot Study	USA	25 control group 25 intervention group	Hospital	The iGetBetter system	Usual care	Significant increases in subjective memory capacity and change, functional status, self-efficacy, quality of life, self-care knowledge, and self-care competence were seen in the intervention group.
Seto et al., 2012[52]	Mobile Phone-Based Telemonitoring for Heart Failure	Canada	50 control group 50 intervention group	Clinic	Telemonitoring	Usual care	The capacity to improve patient treatment regimens is one of the

	Management: A Randomized Controlled Trial						most significant changes in clinical management brought about by telemonitoring technologies.
Hindricks et al., 2014[53]	Implant-based multiparameter telemonitoring of patients with heart failure (IN-TIME): a randomized controlled trial	Australia, Europe, and Israel.	331 control group 333 intervention group	Clinic	Telemonitoring	Usual care	The number of hospital admissions for worsening heart failure (p=038 and the number of patients affected (p=035 respectively) did not differ significantly between the telemonitoring and control groups.