



## Nonpharmacological interventions to improve quality of life in heart failure: an integrative review

*Intervenções não farmacológicas para melhor qualidade de vida na insuficiência cardíaca: revisão integrativa*  
*Intervenciones no farmacológicas para una mejor calidad de vida en la insuficiencia cardíaca: revisión integrativa*

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### ABSTRACT

**Objective:** to identify articles that assessed the effectiveness or efficacy of nonpharmacological interventions to improve quality of life of people with heart failure in the literature. **Method:** an integrative literature review was performed in Lilacs, MedLine and SciELO databases, including randomized or nonrandomized clinical trials and quasi-experimental studies published between 2003 and 2014, in Portuguese, English or Spanish. **Results:** twenty-three studies were included. The categories of nonpharmacological interventions that improved quality of life of people with heart failure were: Remote health monitoring, Instructions on health practices, Physical activity follow-up and Traditional Chinese Medicine practices. **Conclusion:** these results can guide the selection of interventions to be implemented by health professionals that treat people with heart failure. Future systematic reviews with meta-analyses are needed in order to identify the most effective interventions for improving these individuals' quality of life.

**Descriptors:** Clinical trials; Heart failure; Quality of Life; Review; Nursing.

### RESUMO

**Objetivo:** identificar, na literatura, artigos que avaliaram a efetividade ou eficácia de intervenções não farmacológicas para melhorar a qualidade de vida de pessoas com insuficiência cardíaca. **Método:** revisão integrativa de literatura realizada nas bases de dados Lilacs, MedLine e SciELO, incluindo ensaios clínicos randomizados ou não randomizados e estudos quase-experimentais publicados entre 2003 e 2014, em português, inglês e espanhol. **Resultados:** foram incluídos 23 estudos. As categorias de intervenções não farmacológicas que melhoraram a qualidade de vida de pessoas com insuficiência cardíaca foram: Monitoramento remoto da saúde, Orientação sobre práticas de saúde, Acompanhamento de atividade física e Práticas de Medicina Tradicional Chinesa. **Conclusão:** estes resultados podem direcionar a seleção de intervenções a serem implementadas por profissionais de saúde que cuidam de pessoas com insuficiência cardíaca. Futuras revisões sistemáticas com metanálise são necessárias para identificar as intervenções mais eficazes para melhorar a qualidade de vida desses indivíduos.

**Descritores:** Estudos de Intervenção; Insuficiência Cardíaca; Qualidade de Vida; Revisão; Enfermagem.

### RESUMEN

**Objetivo:** identificar, en la literatura, artículos que evaluaron la efectividad o eficacia de intervenciones no farmacológicas para mejorar la calidad de vida de personas con insuficiencia cardíaca. **Método:** revisión integrativa de literatura realizada en las bases de datos Lilacs, MedLine y SciELO, incluyendo ensayos clínicos aleatorios o no aleatorios y estudios casi experimentales publicados entre 2003 y 2014, en portugués, inglés y español. **Resultados:** fueron incluidos 23 estudios. Las categorías de intervenciones no farmacológicas que mejoraron la calidad de vida de personas con insuficiencia cardiaca fueron: Monitoreo remoto de la salud, Orientación sobre prácticas de la salud, Acompañamiento de actividad física y Prácticas de Medicina China Tradicional. **Conclusión:** estos resultados pueden direccionar la selección de intervenciones a ser implantadas por profesionales

de la salud que tratan de personas con insuficiencia cardiaca. Futuras revisiones sistemáticas con meta-análisis son necesarias para identificar las intervenciones más eficaces para mejorar la calidad de vida de estos individuos.

**Descritores:** Estudios de Intervención; Insuficiencia Cardíaca; Calidad de Vida; Revisión; Enfermería.

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## INTRODUCTION

Among chronic non-communicable diseases, cardiovascular diseases (CVDs) are the main cause of morbidity and mortality in Brazil and worldwide, accounting for 9.9% of all hospitalizations from January to October, 2015, according to data from the Brazilian Unified Health System (SUS, as per its acronym in Portuguese)<sup>(1-2)</sup>. Among them, heart failure (HF) stands out, with 19.4% of CVD hospitalizations in the SUS in 2015<sup>(1)</sup>.

Various studies have shown that the quality of life (QoL) of individuals with HF is impaired<sup>(3-4)</sup>. Quality of life is defined by the World Health Organization as “an individual’s perception of their position in life, in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns”<sup>(5)</sup>.

Poor QoL in individuals with HF is associated with higher mobility limitations and higher prevalence of pain and discomfort, anxiety and depression when compared to the general population and to those with other chronic conditions<sup>(3)</sup>. Moreover, lower QoL scores are independent predictors of a poor prognosis, including death, urgent cardiac transplantation, implantation of left ventricular assist device or hospital readmission for non-ischemic HF decompensation<sup>(6)</sup>.

In order to offer quality health care to people with HF and favor a better prognosis, health professionals must identify interventions that are effective for improving their QoL and, as a consequence, their clinical outcomes.

Studies demonstrate improvement in QoL for people with HF by pharmacological<sup>(7)</sup> and surgical<sup>(8)</sup> interventions. However, nurses can improve outcomes through nonpharmacological interventions if they are aware of their efficacy or effectiveness<sup>(9)</sup>. Thereby, the aim of this study was to identify articles that assessed the effectiveness or efficacy of nonpharmacological interventions to improve QoL of people with HF in the literature.

## METHOD

This integrative literature review was performed in six stages<sup>(10)</sup>:

1. Selection of research question: “What is the effectiveness or efficacy of nonpharmacological interventions to improve quality of life of people with heart failure?” Efficacy was considered when assessing randomized clinical trials, and effectiveness was considered for nonrandomized clinical trials and quasi-experimental studies. The mnemonic PICO strategy was used for the selection of the research question (Patient: people with heart failure; Interventions: nonpharmacological interventions; Comparison: not used; Outcomes: quality of life. Since this study did not aim to compare interventions, element C was not employed).
2. Definition of inclusion and exclusion criteria for studies and sample selection: randomized clinical trials, nonrandomized clinical trials and quasi-experimental studies published between 2003 and 2014 in Portuguese, Spanish or English that assessed QoL of people with HF after performance of a nonpharmacological intervention. Articles related to patients that used mechanical circulatory assist devices and/or received palliative care were excluded.
3. Critical analysis of findings: after summarizing the study’s methodological characteristics, data were categorized per type of intervention conducted by the authors.
4. Description of evidence found: results regarding efficacy, effectiveness or lack of effects on QoL improvement were reported for each intervention category.

## RESULTS

The authors initially found 2291 articles, of which 23 were included<sup>(12-34)</sup>, according to Figure 1. Regarding year of publication, nine articles were dated 2012<sup>(15-16,18,20-22,29-31)</sup>, followed by years 2011 (n = 6)<sup>(11-13,17,19,23,33)</sup>, 2010 (n = 4)

(24-25,32,34), 2013 (n = 3)<sup>(14,27-28)</sup> and 2008 (n = 1)<sup>(26)</sup>.

The articles were published in General Cardiology journals<sup>(12-13,16-18,20,22,24-25,28-32,34)</sup>, followed by General Clinical journals<sup>(14-15,26-27,33)</sup>. Two articles were published in Nursing journals<sup>(19,23)</sup> and one was published in a Nutrition journal<sup>(21)</sup> (Chart 1).

As for languages, all articles were published in English. The selected studies were performed in the following countries: USA (n = 8)<sup>(12,15,17,19,24-25,32-33)</sup>, Sweden (n = 2)<sup>(18,23)</sup>, Germany (n = 2)<sup>(22,34)</sup>, Brazil (n = 2)<sup>(21,26)</sup>, Australia (n = 2)<sup>(28-29)</sup>, United Kingdom (n = 2)<sup>(14,31)</sup>, Italy (n = 2)<sup>(16,30)</sup>, Spain (n = 1)<sup>(13)</sup>, Taiwan (n = 1)<sup>(19)</sup> and Iran (n = 1)<sup>(27)</sup>.

Nurses were the professionals performing the interventions in most studies<sup>(12,14-15,19-20,32)</sup>. Another study was performed by nurses in partnership with physical therapists<sup>(24)</sup> or physicians<sup>(22)</sup>, followed by nurses working with physical therapists, physicians and occupational therapists<sup>(18)</sup>.

Six studies did not describe which professionals performed the interventions<sup>(13,26-29,34)</sup>. In four studies, interventions were performed only by physicians<sup>(16-17,25,33)</sup> or physicians working

with physical therapists<sup>(30)</sup>. Two studies were performed only by physical therapists<sup>(23,31)</sup> and two were led by nutritionists<sup>(21)</sup>(Chart 1).

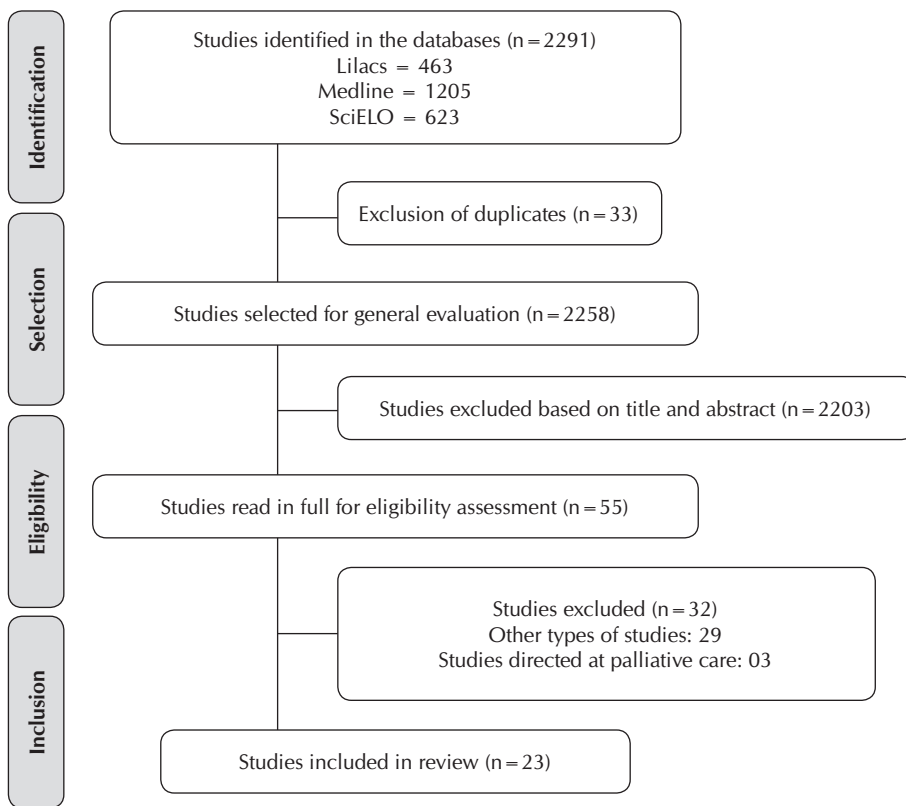


Figure 1 - Flowchart of the study selection process

Chart 1 - Characteristics of studies on interventions for improving quality of life of people with heart failure, 2003-2014

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Remote health monitoring</b>			
Konstam et al. <sup>(12)</sup> , 2011 USA Randomized clinical trial Journal of Cardiac Failure	To compare the program Primary Specialized Care and Care Network of people with HF with and without automated home monitoring.	CG: Monitoring through weekly telephone calls. Patients had continuous access to a database with information on their records, medication and laboratory data (n = 44). IG: Monitoring through a system that provided information on weight, vital signs, transmission of text messages with information on symptoms and functional status. The device was programmed to provide daily analysis of all medication doses (n = 44). Instrument: MLHFQ Monitoring was performed by nurses.	There was no difference in QoL between groups after 45 days (p = 0.416) and 90 days (p = 0.759).
Domingo et al. <sup>(13)</sup> , 2011 Spain Randomized clinical trial Spanish Cardiology Magazine	To assess the impact of a telemedicine program on patients of a multidisciplinary HF unit.	CG: Interactive platform that broadcasts patient data from their homes to the hospital unit through the Internet (n = 44). IG: Interactive platform, another tool for self-monitoring weight, arterial pressure and cardiac frequency, inserted every morning before breakfast (n = 48). Instrument: EQ-5D and MLHFQ Authors did not mention which professionals monitored the training.	There was a difference in QoL between groups as measured by EQ-5D (p = 0.165) or by MLHFQ (p = 0.690) after 12 months.

To be continued

Chart 1

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Remote health monitoring</b>			
Cartwright et al. <sup>(14)</sup> , 2013 United Kingdom Randomized clinical trial British Medical Journal	To assess the effects of home telehealth on QoL, anxiety and depressive symptoms over 12 months in chronic patients.	CG: Care plan with predefined home visits according to severity (n = 728). IG: Tele transmission of vital signs and symptoms. Patients could also get in touch with center office by phone. They received health education information from health centers (n = 845). Instrument: SF-36 and EQ-5D Monitoring was performed by nurses.	There was no difference in QoL between groups (p = 0.807) after 12 months.
Gellis et al. <sup>(15)</sup> , 2012 USA Randomized clinical trial Gerontologist	To assess the impact of telehealth intervention on general and mental health of homebound elderly patients with HF or chronic obstructive pulmonary disease.	CG: Weekly home service (n = 58) IG: Daily monitoring of weight and vital signs, instructions on health education and telephone access to a nurse for clearing doubts related to treatment (n = 57). Instrument: (SF-36) Monitoring was performed by nurses.	There was significant QoL improvement in IG in general health status (p = 0.016) and social functioning (p < 0.014) after three and 12 months.
Landolina et al. <sup>(16)</sup> , 2012 Italy Randomized clinical trial Circulation	To determine whether remote monitoring can lower the number of HF and ICD cases in emergency services.	CG: No ICD data transmission to physician in charge (n = 101). IG: Remote home monitoring. ICD data transmitted to a center that reported changes to physician in charge (n = 99). Instrument: MLHFQ Intervention was performed by physicians.	Significant QoL improvement in IG after 16 months (p = 0.026).
<b>Instructions on health practices</b>			
Baker et al. <sup>(17)</sup> , 2011 USA Randomized clinical trial Journal of Cardiac Failure	To assess the effects of two different training levels for adoption of self-care and quality of life behaviors for people with HF.	CG: Single session for education and routine care (n = 302). IG: Intensive training for self-care employing daily weight measurements to guide diuretic self-adjustment, including an individualized plan. Over the following four weeks, patients received five to eight phone calls from the educator to reinforce education and give instructions on self-care skills. The two first calls focused on self-monitoring and self-management of weight. Later calls focused on self-maintenance, including adherence to medication, limitation of sodium intake and exercise (n = 303). Instrument: MLHFQ Intervention was performed by physicians.	There was significant QoL improvement in IG after four weeks (p < 0.001).
Ekman et al. <sup>(18)</sup> , 2012 Sweden Randomized clinical trial European Heart Journal	To assess whether person-centered care reduces hospitalization length, improves activities of daily living and impacts QoL and rehospitalization.	CG: Routine care (n = 123) IG: Person-centered care, planned based on careful clinical and social assessments at admission, including planned investigations, treatment objectives and length of hospitalization. The plan was then readjusted with the patient and finalized in 48 to 72 hours. During the plan's performance, patients self-assessed their symptoms through a Likert scale. Additional or new information was checked 72 hours after admission and every 48 hours to assess and adjust the plan (n = 125). Instrument: KCCQ Intervention was performed by nurses, physicians, physical therapists and occupational therapists.	There was no difference in QoL between groups (p = 0.60) after three months.

To be continued

Chart 1

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Instructions on health practices</b>			
Wang et al. <sup>(19)</sup> , 2011 Taiwan Randomized clinical trial Journal of Nursing Research	To explore the effects of a self-care program for elderly persons with symptomatic HF in terms of: functional state, QoL, emergency visits and rehospitalizations three months after hospital discharge.	CG: Routine care during hospitalization (n = 13) IG: Daily visits during hospitalization for symptom assessment and patient education. Before discharge, an informal meeting was conducted with families to remind them of medication and date of next clinical follow-up. The first phone call was made three or four days after discharge. During home visits, not only HF signs and symptoms were assessed, but also how they implemented self-care skills in their daily routines (n = 14) Instrument: (SF-36) Monitoring was performed by nurses.	There was significant QoL improvement in IG after three months (p < 0.05).
Dekker et al. <sup>(20)</sup> , 2012 USA Randomized clinical trial Journal of Cardiac Failure	To test short-term effects of a brief cognitive therapy intervention for patients hospitalized with HF who presented depressive symptoms.	CG: HF instructions and brief written information on emotional aspects of living with HF (n = 21). IG: A cognitive therapy session during hospitalization, a propelling phone call and a brochure with the intervention's content for taking home (n = 21). Instrument: MLHFQ Intervention was performed by nurses.	There was no difference in QoL between groups (p = 0.45) one week after discharge and after three months.
Alves et al. <sup>(21)</sup> , 2012 Brazil Randomized clinical trial Hospital nutrition	To assess whether nutritional instructions improve adherence to diet guidelines (sodium restriction and diet quality), nutritional knowledge, anthropometric measures and QoL in people with HF.	CG: Assessment of anthropometric data (n = 23) IG: Assessment of anthropometric data and nutritional instructions and their link to HF. A calendar, created for the intervention, was handed out as educational strategy. Goals were set to improve diet adherence and motivation. After one month, the strategy was intensified whenever inadequate behaviors were detected (n = 23). Instrument: MLHFQ Assessment and instructions were performed by a nutritional therapist.	There was no difference in QoL between groups (p = 0.736) after six weeks and six months.
Angermann et al. <sup>(22)</sup> , 2012 Germany Randomized clinical trial Circulation Heart Failure	To compare the impact of routine care with the software HeartNetCare in relation to time until death or rehospitalization of HF patient.	CG: Routine care: standard planning post-discharge, which includes treatment plans and appointments with a cardiologist between 7 and 14 days (n = 363). IG: Presence during hospitalization, with practical supervision of measurements of arterial pressure, heart frequency and symptoms, distribution of educational resources on self-monitoring; telephone monitoring, with a questionnaire on signs of worsening HF, other symptoms, medication, use of health services, mood and general health status and well-being; explanation and names of medication; necessary adjustments to specialized care administered by a nurse (n = 352). Instrument: SF-36 The program was coordinated by nurses and involved general physicians and cardiologists.	There was significant improvement in IG in the components physical health (p = 0.03) and physical functioning (p = 0.03) of SF-36 after 180 days.
<b>Physical activity follow-up</b>			
Pihl et al. <sup>(23)</sup> , 2011 Sweden Randomized clinical trial European Journal of Cardiovascular Nursing	To determine the effects on physical capacity and QoL of an exercise program in elderly patients with chronic HF receiving primary care.	CG: Routine care without exercise (n = 31) IG: Aerobic and muscle exercise at home for 12 months, adapted to patients' physical capacity (n = 28). During the first six months, patients exercised once a week with a group in the primary care center and three times a week at home. During the final six months, they exercised three times a week at home and once a month in the basic care center. Instrument: MLHFQ, SF-36, EQ-5D Exercises were guided by a physical therapist.	There was significant improvement in the general health (p = 0.048) and physical components (p = 0.026) of SF-36 after three months; physical dimension of MLHFQ (p = 0.008) after three months; and EQ-5D after three months (p = 0.016) and after 12 months (p = 0.034)

To be continued

Chart 1

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Physical activity follow-up</b>			
Pozehl et al. <sup>(24)</sup> , 2010 USA Randomized clinical trial Heart & Lung	To determine differences in self-efficacy for exercise in IG when compared to CG and determine differences in symptoms.	CG: Educational sessions with topics relevant to HF (n = 20). IG: Structured aerobic exercise and resistance training + group meetings and educational sessions with themes addressing HF (n = 22). Instrument: KCCQ Exercises were guided by a physical therapist and a nurse.	There was significant improvement in both groups, with statistically higher increase in IG (p < 0.01) after 12 weeks.
Kitzman et al. <sup>(25)</sup> , 2010 USA Randomized clinical trial Circulation Heart Failure	To test the hypothesis that supervised physical training improves peak O <sub>2</sub> consumption and QoL for elderly individuals with HF and who have preserved left ventricular ejection fraction.	CG: Instructions passed through telephone calls every two weeks, over 16 weeks (n = 27) IG: Aerobic exercise three times a week for 16 weeks, in a total of 48 sessions at a specific location (n = 26). Instrument: MLHFQ and SF-36 Training was monitored by physicians.	Improvement happened only on MLHFQ's physical subscale (p = 0.03) and there was no significant difference in SF-36.
Bocalini et al. <sup>(26)</sup> , 2008 Brazil Randomized clinical trial Clinics (São Paulo)	To assess whether guided and monitored physical exercises can be considered safe for patients with HF, and whether exercise can benefit functional capacity, based on activities of daily living, autonomy and QoL.	CG: Routine care (n = 20) IG: Aerobic and muscle exercises three times a week over six months, with individually controlled intensity (n = 22). Instrument: WHOQOL-BREF Authors did not mention which professionals monitored the training.	There was significant improvement in intervention group across a number of WHOQOL-BREF domains (p < 0.001) after six months.
Fayazi et al. <sup>(27)</sup> , 2013 Iran Nonrandomized clinical trial Scandinavian Journal of Caring Sciences	To assess the effect of a home walking program on performance and QoL of patients with HF.	CG: No intervention (n = 30) IG: Instructions about walking for 30 minutes three times per week over eight weeks + information on how to exercise safely and properly, including self-monitoring for symptoms, stress level and exercise-related problems, explained and summarized in a brochure + daily telephone calls to monitor adherence, progress, doubt clearing, and individualized feedback (n = 30) Instrument: MLHFQ Authors did not mention which professionals monitored the training.	There was significant QoL improvement in IG (p < 0.001) after eight weeks.
Smart & Murison <sup>(28)</sup> , 2013 Australia Quasi-experimental study Congestive Heart Failure	To identify changes in exercise basal rate, in QoL and in depression after physical training for patients with congestive heart failure.	IG: Sixteen weeks of physical training in bicycle ergometer three times per week + series of five muscle strength exercises from the 8 <sup>th</sup> until the 16 <sup>th</sup> week, adapted to each patient (n = 30). Instrument: MLHFQ Authors did not mention which professionals monitored the training.	There was significant QoL improvement after 16 and 52 weeks (p < 0.001).

To be continued

Chart 1

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Physical activity follow-up</b>			
Smart & Steele <sup>(29)</sup> , 2012 Australia Randomized clinical trial Congestive Heart Failure	To determine whether intermittent physical training produces similar results to a continuous training program for people with chronic HF.	CG: Intermittent physical training (16 weeks of bicycle ergometer three times per week for 60 minutes, with 60 seconds of work and 60 seconds of rest) (n = 10). IG: Continuous physical training (16 weeks of bicycle ergometer three times per week for 30 minutes, continually) (n = 13). Instrument: MLHFQ and SF-36 Authors did not mention which professionals monitored the training.	CG obtained improvement on emotional role subscale of SF-36 (p = 0.05) and did not obtain improvements in MLHFQ (p = 0.11). IG obtained improvement in vitality subscale of SF-36 (p = 0.03) and in MLHFQ (p = 0.02) after 16 weeks.
Belardinelli et al. <sup>(30)</sup> , 2012 Italy Randomized clinical trial Journal of the American College of Cardiology	To determine whether moderate physical training program monitored over ten years improves functional capacity and QoL of patients with HF in functional classes II and III.	CG: Activities of daily living, avoiding exercises monitored by professionals. Subjects were instructed on nutrition, stress decrease, quitting smoking and physical training. They consulted cardiologist every three months (n = 60). IG: Aerobic activity sessions in bicycle ergometer and/or treadmill (three weekly sessions over two months, followed by two yearly sessions, over 10 years) (n = 63). Instrument: MLHFQ Activities were managed by a physical therapist and a cardiologist physician.	IG presented significant improvement in QoL score (p < 0.05) after ten years.
Witham et al. <sup>(31)</sup> , 2012 United Kingdom Randomized clinical trial Circulation Heart Failure	To test the efficacy of a more intense physical program aimed at elderly patients functionally compromised by HF.	CG: Brochures with instructions on diet, exercise and lifestyle (n = 54) IG: Gymnastics class twice per week over eight weeks. After eight weeks, 16 weeks of exercise were performed at patients' homes + educational brochures on benefits of exercise, goals and how to work toward them, relaxation techniques, information on how thoughts and feelings affect symptoms and how to handle difficulties (n = 53). Instrument: MLHFQ and EQ-5D Gymnastics classes were monitored by a physical therapist.	There were no significant differences between groups (p = 0.42 in EQ5D and p = 0.12 in MLHFQ) after 24 weeks.
Howie-Esquivel et al. <sup>(32)</sup> , 2010 USA Quasi-experimental study Journal of Cardiac Failure	To determine whether an eight-week yoga program is safe and can positively influence physical and psychological functioning of patients with HF.	IG: Two weekly 60-minute yoga classes over eight weeks. Participants were also instructed to practice breathing exercises at home for 15 minutes three times per week (n = 12) Instrument: KCCQ Yoga sessions were conducted by two nurses.	There was improvement in symptom stability subscale of KCCQ instrument (p = 0.02) after eight weeks.
<b>Traditional Chinese Medicine practices</b>			
Yeh et al. <sup>(33)</sup> , 2011 USA Randomized clinical trial Archives of Internal Medicine	To determine whether a Tai Chi program over 12 weeks improves ability to perform exercises and quality of life of people with chronic HF as a complement for standard medical care in comparison to health education.	CG: Two educational weekly sessions over 12 weeks + educational brochures on HF, its pharmacological and non-pharmacological treatments and self-control of symptoms and feelings related to HF (n = 50). IG: Two weekly Tai Chi sessions over 12 weeks + educational brochures (n = 50). Instrument: MLHFQ There is no mention of which professionals conducted Tai Chi sessions, and CG was conducted by a nurse.	There was significant QoL improvement in IG compared to CG (p < 0.07) after 12 weeks.

To be continued

Chart 1 (concluded)

Author, year, country, design, publication	Objective	Method	Conclusion
<b>Traditional Chinese Medicine practices</b>			
Kristen et al. <sup>(34)</sup> , 2010 Germany Randomized clinical trial Heart	To investigate the effects of acupuncture on cardiorespiratory functioning, physical exercise tolerance and QoL of patients with congestive HF.	CG: Ten placebo sessions twice per week over five weeks (2 cm needle next to real point) (n = 8). IG: Ten sessions of auricular acupuncture twice per week over five weeks (n = 9), Instrument: SF-36 Sessions were performed by an acupuncturist (occupation not mentioned).	There was improvement in IG in general health subscale (p = 0.06) of SF-36 after five weeks.

Note: ICD: Implantable cardioverter defibrillator; EQ-5D: EuroQol-5; CG: Control Group; IG: Intervention Group; HF: Heart failure; KCCQ: Kansas City Cardiomyopathy Questionnaire; MLHFQ: Minnesota Living with Heart Failure Questionnaire; QoL: Quality of Life; SF-36: Medical Outcomes Study Short Form Health Survey; WHOQOL-BREF: World Health Organization Quality of Life.

Most studies<sup>(12-26,29-31,33-34)</sup> were randomized clinical trials (n = 18), followed by two quasi-experimental studies<sup>(28,32)</sup>. Only one article<sup>(27)</sup> was a non-randomized clinical trial (4.3%) (Chart 1). Sample sizes ranged between 12 and 1573 subjects, with follow-ups lasting between eight weeks and ten years.

Nonpharmacological interventions proposed to improve the QoL of people with HF were: Remote health monitoring<sup>(12-16)</sup>, Instructions on health practices<sup>(17-22)</sup>, Physical activity follow-up<sup>(23-32)</sup> and Traditional Chinese Medicine practices<sup>(33-34)</sup>. Chart 1 also presents characteristics of all studies, according to these categories.

Sixteen (69.6%) interventions were efficacious or effective. Among the 13 efficacious interventions, six were in the "Physical activity follow-up" category, two were in "Remote monitoring"<sup>(23-25,29-30)</sup>, two were in "Instructions on health practices"<sup>(17,19)</sup>, two others were in "Traditional Chinese medicine practices"<sup>(33-34)</sup> and one was in "Instructions on health practices"<sup>(22)</sup>. Among the three effective interventions, two were in the category "Physical activity follow up"<sup>(27-28)</sup> and one was in "Traditional Chinese medicine practices" (Chart 1)<sup>(32)</sup>.

Regarding QoL measurement instruments, 14 studies used the Minnesota Living with Heart Failure Questionnaire (MLHFQ)<sup>(12-13,16-17,20-21,23,25,27-31,33)</sup>, eight used the Medical Outcomes Study Short Form Health Survey (SF-36)<sup>(14-15,19,22-25,29,34)</sup>, four used the EuroQol-5 (EQ-5D)<sup>(13-14,23,31)</sup>, three used the Kansas City Cardiomyopathy Questionnaire (KCCQ)<sup>(18,24,32)</sup> and one used the World Health Organization Quality of Life short form (WHOQOL-bref)<sup>(26)</sup>. It should be noted that some articles used more than one instrument to assess QoL (Chart 1).

## DISCUSSION

According to the Brazilian Ministry of Health, primary health care nurses and physicians are the main professionals following patients with chronic diseases<sup>(35)</sup>. Patients with HF, one of the most aggressive non-communicable chronic diseases, have reduced QoL because of dyspnea and functional limitations, which interfere in social interactions and activities of daily living<sup>(34)</sup>. Thus, nurses must plan and implement strategies that can improve the QoL of this population.

In this study, it was found that nonpharmacological interventions improved the QoL of people with HF. Although most studies are randomized clinical trials, therefore with a high degree of evidence and representative of American, Asian and European continents, some of them used small samples, which may have limited the generalization of the results obtained. Another factor worth noting is the use of different scales for assessing QoL, in addition to differences in protocols of interventions studied.

A systematic review with meta-analysis aiming to assess conceptual models and psychometric properties of five QoL assessment instruments for individuals with HF (MLHFQ, Chronic Heart Failure Questionnaire - CHFQ, Quality of Life Questionnaire for Severe Heart Failure - QLQ-SHF, KCCQ and Left Ventricular Dysfunction Questionnaire - LVD-36) showed that all had adequate psychometric properties, although there are concerns related to the construct validity of CHFQ and the response capacity of the QLQ-SHF<sup>(36)</sup>. Thus, QoL measurements used in studies included in this review can be considered reliable, since CHFQ and QLQ-SHF were not used by the authors.

Remote health monitoring interventions, Instructions on health practices, Physical activity follow-up and Traditional Chinese Medicine practices can be considered positive self-care components of for people with HF.

In the context of HF, self-care is a naturalistic decision-making process that involving the choice of behaviors to maintain physiologic stability and the response to symptoms when they occur. Self-care demands self-maintenance, self-monitoring and self-management, which consist of the adoption of behaviors for improving well-being, preserve health or maintain physical and emotional stability (e.g., a lifestyle that includes physical activities and adherence to drug treatment), in addition to routine and continuous monitoring and surveillance of the body to recognize signs and symptoms and the ability to assess them to determine the need for action<sup>(37)</sup>. Regarding remote health monitoring, studies show a positive impact for telemonitoring of vital signs, weight<sup>(15)</sup> and cardioverter defibrillator data<sup>(16)</sup> by nurses and physicians on the QoL of people with HF. Telemonitoring facilitates adherence to medication, recognition of signs



and symptoms and accountability for one's own health management<sup>(22)</sup>. Early detection of signs and symptoms of HF decompensation can reduce the number of hospitalizations and their length, as well as improve these patients' QoL<sup>(13)</sup>.

Regarding instructions on health practices, nurses stand out for promoting significant improvements in outcomes, such as functional status, self-efficacy, memory, knowledge of disease and QoL<sup>(38)</sup>. In this category, in the study that proved effective in improving QoL of people with HF, there was telephone follow-up that involved aspects of self-maintenance and self-management, in addition to practical supervision of skills for self-monitoring and self-management by a nurse<sup>(22)</sup>.

Telephone monitoring supports QoL improvements, since it facilitates specialized care for individuals who are unable to attend appointments because of disease, long distances or home restrictions. It also favors knowledge of HF symptoms, leading to early seeking for hospitals in cases of decompensation<sup>(22,39)</sup>. Therefore, individualized education focused on disease self-management improves individuals' QoL<sup>(40)</sup>. This type of monitoring has good results due to low operational costs and easiness obtaining of information<sup>(36-41)</sup>.

Another important intervention and one of the most commonly found in this review was physical activity follow-up<sup>(23-32)</sup>. Exercise practice supports physical capacity and functional independence, improving HF symptoms, such as dyspnea, consequently contributing for better QoL<sup>(23)</sup>. Thus, health professionals must ensure that they are used over time and the patient needs to assess and adapt the exercise intensity for a continuous improvement. This prescription must be individualized, after tests to assess physical capacity<sup>(23)</sup>. However, it must be emphasized that physical activity efficacy and effectiveness follow-up interventions had small-sized samples (12 to 123 subjects)<sup>(23-30)</sup>. The study with the longest follow-up length<sup>(30)</sup> stands out with ten years.

Yoga is a combination of physical exercise, breathing techniques and meditation that positively influences the autonomous cardiac system<sup>(42)</sup>. Yoga programs enable improvement in symptom perception, higher muscle strength and exercise tolerance, in addition to balance. It also offers people with HF benefits for their main symptom: dyspnea<sup>(32)</sup>. A literature review showed that yoga can have as much efficacy as regular exercises in improving blood sugar, lipids, fatigue, pain and sleep<sup>(43)</sup>.

Tai Chi and acupuncture sessions are Traditional Chinese Medicine practices that are regulated by the Brazilian Ministry of Health. With the objective of offering the population wider access to these services, the Ministry approved the National Policy for Integrative and Complementary Practices in the SUS,

in 2006, which defines guidelines for adding traditional Chinese medicine procedures, services and products to SUS<sup>(44)</sup>.

Particularly, Tai Chi sessions have the potential to be clinically beneficial by improving QoL, mood, physical activities, lowering anxiety, increasing muscle strength and balance in elderly people, contributing for fall prevention. Tai Chi can be a safe alternative for moderate intensity exercise training for people with HF<sup>(32)</sup>, because it integrates light and moderate aerobic activities, which exercises upper and lower extremities and promotes strengthening. It also involves meditation, which can favor stress management and psychosocial benefits for people with HF<sup>(33)</sup>.

A systematic literature review showed that this activity seems safe and offers positive QoL effects for people with chronic diseases, especially for those with cerebrovascular, respiratory and musculoskeletal disorders<sup>(45)</sup>.

As for acupuncture, Kristen et al.<sup>(34)</sup> demonstrated that its effects on respiratory efficiency, physical exercise capacity and post-exercise recovery are associated with better QoL<sup>(34)</sup>. Authors emphasize that these factors can partly reflect the impaired QoL of people with HF because of dyspnea and functional limitations. Thus, acupuncture supports individuals' self-maintenance behaviors.

However, a recent systematic literature review found that only the study written by Kristen et al.<sup>(34)</sup>, mentioned above, assessed QoL as an outcome after using acupuncture. Further studies found a decrease in the levels of B-type natriuretic peptide, lower scores for APACHE II risk of mortality and improvement in hemodynamic levels<sup>(46)</sup>.

In this context, it was found that a variety of interventions are efficacious or effective for improving QoL of people with HF by qualifying the individuals for the adoption of behaviors of self-maintenance, self-monitoring of signs and symptoms and self-health management. Because of this, nurses can and should use nonpharmacological strategies to offer better care for these people.

## CONCLUSION

The nonpharmacological intervention categories found in this literature review that improved QoL of people with HF were: Remote health monitoring, Instructions on health practices, Physical activity follow-up and Traditional Chinese Medicine practices. These results can guide the selection of interventions to be implemented by health professionals that treat people with HF. Future systematic reviews with meta-analysis are needed in order to identify the most effective interventions for improving these individuals' QoL.

## REFERENCES

1. Brasil. Ministério da Saúde. DATASUS. Morbidade hospitalar do SUS [Internet]. 2015[cited 2016 Jan 12]. Available from: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sih/cnv/niuf.def>.
2. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart disease and stroke statistics - 2015 Update: a report from the American Heart Association. *Circulation* 2015;131:e29-e322.
3. Comín-Colet J, Anguita M, Formiga F, Almenar L, Crespo-Leiro MG, Manzano L, et al. Health-related quality of life of patients with chronic systolic heart failure in Spain: results of

- the VIDA-IC Study. *Rev Esp Cardiol* [Internet]. 2016[cited 2016 Jan 10];69(3):256-71. Available from: <http://www.revespcardiol.org/en/health-related-quality-of-life-of/articulo/90449176/>.
4. Gorostiza I, Escobar A, Bilbao A, Garcia-Perez L, Navarro G, Quirós R. Health-related quality of life in heart failure patients: health utilities and predictive determinants. *Value Health* [Internet]. 2015[cited 2016 Jan 10];18(7):A397. Available from: [http://www.valueinhealthjournal.com/article/S1098-3015\(15\)02981-2/abstract](http://www.valueinhealthjournal.com/article/S1098-3015(15)02981-2/abstract)
  5. The WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med* [Internet]. 1995[cited 2016 Jan 10];41(10):1403-10. Available from: <http://www.sciencedirect.com/science/article/pii/027795369500112K>
  6. Szyguła-Jurkiewicz B, Zakliczyński M, Owczarek A, Partyka R, Mościński M, Pudło R, et al. Low health-related quality of life is a predictor of major adverse cardiovascular events in patients with chronic nonischemic heart failure. *Kardiologichir Torakochirurgia Pol* [Internet]. 2014[cited 2016 Jan 10];11(3):283-8. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4283881/pdf/KITP-11-23593.pdf>
  7. Lewis EF, Kim HY, Claggett B, Spertus J, Heitner JF, Assmann SF, et al. Impact of spironolactone on longitudinal changes in health-related quality of life in the treatment of preserved cardiac function heart failure with an aldosterone antagonist trial. *Circ Heart Fail* [Internet]. 2016[cited 2016 Jan 10];9(3):pii- e001937. Available from: <http://circheartfailure.ahajournals.org/content/9/3/e001937.long>
  8. Balci KG, Balci MM, Akboğa MK, Sen F, Açar B, Yılmaz S, et al. Perceived benefits of implantable cardioverter defibrillator implantation among heart failure patients and its relation to quality of life: a cross-sectional study. *Cardiol Ther* [Internet]. 2015[cited 2016 Jan 10];4(2):155-65. Available from: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4675745/pdf/40119\\_2015\\_Article\\_49.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4675745/pdf/40119_2015_Article_49.pdf)
  9. Rogers C, Bush N. Heart failure: pathophysiology, diagnosis, medical treatment guidelines, and nursing management. *Nurs Clin North Am* [Internet]. 2015[cited 2016 Jan 10];50(4):787-99. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26596665>
  10. Mendes KDS, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. *Texto Contexto Enferm* [Internet]. 2008[cited 2016 Jan 10];17(4):758-64. Available from: <http://www.scielo.br/pdf/tce/v17n4/18.pdf>
  11. Ursi ES. Prevenção de lesões de pele no perioperatório: revisão integrativa da literatura [dissertação]. Ribeirão Preto: Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo. 2005.
  12. Konstam V, Gregory D, Chen J, Weintraub A, Patel A, Levine D, et al. Health-related quality of life in a multicenter randomized controlled comparison of telephonic disease management and automated home monitoring in patients recently hospitalized with heart failure: SPAN-CHF II trial. *J Card Fail*. 2011;17(2):151-7.
  13. Domingo M, Lupón J, González B, Crespo E, López R, Ramos A, et al. Noninvasive remote telemonitoring for ambulatory patients with heart failure: effect on number of hospitalizations, days in hospital, and quality of life. CARME (Catalan Remote Management Evaluation) study. *Rev Esp Cardiol* [Internet]. 2011[cited 2016 Jan 10];64(4):277-85. Available from: <http://www.revespcardiol.org/en/noninvasive-remote-telemonitoring-for-ambulatory/articulo/90002056/>.
  14. Cartwright M, Hirani SP, Rixon L, Beynon M, Doll H, Bower P, et al. Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth questionnaire study): nested study of patient reported outcomes in a pragmatic, cluster randomized controlled trial. *BMJ* [Internet]. 2013[cited 2016 Jan 10];346:f653. Available from: <http://www.bmj.com/content/bmj/346/bmj.f653.full.pdf>
  15. Gellis ZD, Kenaley B, McGinty J, Bardelli E, Davitt J, Ten Have T. Outcomes of a telehealth intervention for homebound older adults with heart or chronic respiratory failure: a randomized controlled trial. *Gerontologist* [Internet]. 2012[cited 2016 Jan 10];52(4):541-52. Available from: <http://gerontologist.oxfordjournals.org/content/52/4/541.long>
  16. Landolina M, Perego GB, Lunati M, Curnis A, Guenzati G, Vicentini A, et al. Remote monitoring reduces healthcare use and improves quality of care in heart failure patients with implantable defibrillators: the evolution of management strategies of heart failure patients with implantable defibrillators (EVOLVO) study. *Circulation* [Internet]. 2012[cited 2016 Jan 10];125(24):2985-92. Available from: <http://circ.ahajournals.org/content/125/24/2985.long>
  17. Baker DW, Dewalt DA, Schillinger D, Hawk V, Ruo B, Bibbins-Domingo K, et al. The effect of progressive, reinforcing telephone education and counseling versus brief educational intervention on knowledge, self-care behaviors and heart failure symptoms. *J Card Fail* [Internet]. 2011[cited 2016 Jan 10];17(10):789-96. Available from: [http://www.onlinejcf.com/article/S1071-9164\(11\)00628-2/abstract](http://www.onlinejcf.com/article/S1071-9164(11)00628-2/abstract)
  18. Ekman I, Wolf A, Olsson LE, Taft C, Dudas K, Schaufelberger M, et al. Effects of person-centred care in patients with chronic heart failure: the PCC-HF study. *Eur Heart J* [Internet]. 2012[cited 2016 Jan 10];33:1112-9. Available from: <http://eurheartj.oxfordjournals.org/content/early/2011/09/15/eurheartj.ehr306>
  19. Wang SP, Lin LC, Lee CM, Wu SC. Effectiveness of a self-care program in improving symptom distress and quality of life in congestive heart failure patients: a preliminary study. *J Nurs Res* [Internet]. 2011[cited 2016 Jan 10];19(4):257-66. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22089651>
  20. Dekker RL, Moser DK, Peden AR, Lennie TA. Cognitive therapy improves three-month outcomes in hospitalized patients with heart failure. *J Card Fail* [Internet]. 2012[cited 2016 Jan 10];18(1):10-20. Available from: [http://www.onlinejcf.com/article/S1071-9164\(11\)01194-8/abstract](http://www.onlinejcf.com/article/S1071-9164(11)01194-8/abstract)
  21. Alves FD, Souza GC, Brunetto S, Perry IDS, Biolo A. Nutritional orientation, knowledge and quality of diet in heart failure: randomized clinical trial. *Nutr Hosp* [Internet]. 2012[cited 2016 Jan 10];27(2): 441-8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22732966>
  22. Angermann CE, Störk S, Gelbrich G, Faller H, Jahns R, Frantz S. Mode of action and effects of standardized collaborative

- disease management on mortality and morbidity in patients with systolic heart failure: the Interdisciplinary Network for Heart Failure (INH) study. *Circ Heart Fail* [Internet]. 2012[cited 2016 Jan 10];5(1):25-35. Available from: <http://circheartfailure.ahajournals.org/content/5/1/25.long>
23. Pihl E, Cider A, Stromberg A, Fridlund B, Martensson J. Exercise in elderly patients with chronic heart failure in primary care: effects on physical capacity and health-related quality of life. *Eur J Cardiovasc Nurs* [Internet]. 2011[cited 2016 Jan 10];10(3):150-8. Available from: <http://cnu.sagepub.com/content/10/3/150.long>
  24. Pozehl B, Duncan K, Hertzog M, Norman JF. Heart failure exercise and training camp: effects of a multicomponent exercise training intervention in patients with heart failure. *Heart Lung* [Internet]. 2010[cited 2016 Jan 10];39(6 Suppl):S1-13. Available from: [http://www.heartandlung.org/article/S0147-9563\(10\)00136-6/abstract](http://www.heartandlung.org/article/S0147-9563(10)00136-6/abstract)
  25. Kitzman DW, Brubaker PH, Morgan TM, Stewart KP, Little WC. Exercise training in older patients with heart failure and preserved ejection fraction: a randomized, controlled, single-blind trial. *Circ Heart Fail* [Internet]. 2010[cited 2016 Jan 10];3(6):659-67. Available from: <http://circheartfailure.ahajournals.org/content/3/6/659.long>
  26. Bocalini DS, dos Santos L, Serra AJ. Physical exercise improves the functional capacity and quality of life in patients with heart failure. *Clinics* [Internet]. 2008[cited 2016 Jan 10];63(4):437-42. Available from: <http://www.scielo.br/pdf/clin/v63n4/a05v63n4.pdf>
  27. Fayazi S, Zarea K, Abbasi A, Ahmadi F. Effect of home-based walking on performance and quality of life in patients with heart failure. *Scand J Caring Sci* [Internet]. 2013[cited 2016 Jan 10];27(2):246-52. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-6712.2012.01020.x/epdf>
  28. Smart NA, Murison R. Rate of change in physical fitness and quality of life and depression following exercise training in patients with congestive heart failure. *Congest Heart Fail* [Internet]. 2013[cited 2016 Jan 10];19(1):1-5. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/chf.12002/epdf>
  29. Smart NA, Steele M. A comparison of 16 weeks of continuous vs intermittent exercise training in chronic heart failure patients. *Congest Heart Fail*. 2012;18(4):205-11.
  30. Belardinelli R, Georgiou D, Cianci G, Purcaro A. 10-year exercise training in chronic heart failure: a randomized controlled trial. *J Am Coll Cardiol*. 2012;60(16):1521-8.
  31. Witham MD, Fulton RL, Greig CA, Johnston DW, Lang CC, Boyers D, et al. Efficacy and cost of an exercise program for functionally impaired older patients with heart failure: a randomized controlled trial. *Circ Heart Fail* [Internet]. 2012[cited 2016 Jan 10];5(2):209-16. Available from: <http://circheartfailure.ahajournals.org/content/circhf/5/2/209.full.pdf>
  32. Howie-Esquivel J, Lee J, Collier G, Mehling W, Fleischmann K. Yoga in heart failure patients: a pilot study. *J Card Fail* [Internet]. 2010[cited 2016 Jan 10];16(9):742-9. Available from: <https://www.omicsonline.org/references/yoga-in-heart-failure-patients-a-pilot-study-82195.html>
  33. Yeh GY, McCarthy EP, Wayne PM, Stevenson LW, Wood MJ, Forman D, et al. Tai chi exercise in patients with chronic heart failure: a randomized clinical trial. *Arch Intern Med* [Internet]. 2011[cited 2016 Jan 10];171(8):750-7. Available from: <http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/227164>
  34. Kristen AV, Schuhmacher B, Strych K, Lossnitzer D, Friederich HC, Hilbel T, et al. Acupuncture improves exercise tolerance of patients with heart failure: a placebo-controlled pilot study. *Heart* [Internet]. 2010[cited 2016 Jan 10];96(17):1396-400. Available from: <http://heart.bmj.com/content/96/17/1396.long>
  35. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Estratégias para o cuidado da pessoa com doença crônica. Brasília: Ministério da Saúde, 2014.
  36. Garin O, Ferrer M, Pont A, Rué M, Kotzeva A, Wiklund I, et al. Disease-specific health-related quality of life questionnaires for heart failure: a systematic reviews with meta-analyses. *Qual Life Res* [Internet]. 2009[cited 2016 Jan 10];18(1):71-85. Available from: <http://link.springer.com/article/10.1007%2Fs11136-008-9416-4>
  37. Riegel B, Jaarsma T, Strömberg A. A middle-range theory of self-care of chronic illness. *ANS Adv Nurs Sci* [Internet]. 2012[cited 2016 Jan 10];35(3):194-204. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22739426>
  38. Clark AP, McDougall G, Riegel B, Joiner-Rogers G, Innerarity S, Meraviglia M, et al. Health Status and Self-care Outcomes After an Education-Support Intervention for People With Chronic Heart Failure. *J Cardiovasc Nurs* [Internet]. 2015[cited 2016 Jan 10];30(4S):S3-S13. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4276559/pdf/nihms587952.pdf>
  39. Torres HC, Reis IA, Roque C, Faria P. Monitoramento telefônico como estratégia educativa para o autocuidado das pessoas com diabetes na atenção primária. *Cienc Enferm* [Internet]. 2013[cited 2016 Jan 10];19(1):95-105. Available from: [http://www.scielo.cl/pdf/cienf/v19n1/art\\_09.pdf](http://www.scielo.cl/pdf/cienf/v19n1/art_09.pdf)
  40. Odnoletkova I, Goderis G, Nobels F, Aertgeerts B, Annemans L, Ramae D. Nurse-led telecoaching of people with type 2 diabetes in primary care: rationale, design and baseline data of a randomized controlled trial. *BMC Fam Pract* [Internet]. 2014[cited 2016 Jan 10];15:24. Available from: <https://bmcfampract.biomedcentral.com/articles/10.1186/1471-2296-15-24>
  41. Peixoto MRG, Monego ET, Alexandre VP, Souza RGM, Moura EC. Monitoramento por entrevistas telefônicas de fatores de risco para doenças crônicas: experiência de Goiânia, Goiás, Brasil. *Cad Saúde Pública* [Internet]. 2008[cited 2016 Jan 10];24(6):1323-33. Available from: <http://www.scielo.br/pdf/csp/v24n6/13.pdf>
  42. Khattab K, Khattab AA, Ortak J, Richardt G, Bonnemeier H. Iyengar yoga increases cardiac parasympathetic nervous modulation among healthy yoga practioners. *Evid Based Complement Alternat Med*. 2007;4:511-7.
  43. Ross A, Thomas S: The health benefits of yoga and exercise: a review of comparison studies. *J Altern Complement Med* [Internet]. 2010[cited 2016 Jan 10];16:3-12. Available from: <http://online.liebertpub.com/doi/abs/10.1089/acm.2009.0044>
  44. Brasil. Ministério da Saúde. Portaria GM Nº 971, de 03 de maio de 2006. Aprova a Política Nacional de Práticas Integrativas

- e Complementares (PNPIC) no Sistema Único de Saúde [Internet]. 2006[cited 2016 Jan 10]. Available from: [http://189.28.128.100/dab/docs/legislacao/portaria971\\_03\\_05\\_06.pdf](http://189.28.128.100/dab/docs/legislacao/portaria971_03_05_06.pdf).
45. Li G, Yuan H, Zhang W. Effects of Tai Chi on health related quality of life in patients with chronic conditions: a systematic review of randomized controlled trials. *Complement Ther Med* [Internet]. 2014[cited 2016 Jan 10];22(4):743-55. Available from: [http://www.complementarytherapiesinmedicine.com/article/S0965-2299\(14\)00101-0/abstract](http://www.complementarytherapiesinmedicine.com/article/S0965-2299(14)00101-0/abstract)
46. Lee H, Kim T-H, Leem J. Acupuncture for heart failure: A systematic review of clinical studies. *Int J Cardiol* [Internet]. 2016[cited 2016 Jan 10];222:321–31. Available from: [http://www.internationaljournalofcardiology.com/article/S0167-5273\(16\)31589-3/pdf](http://www.internationaljournalofcardiology.com/article/S0167-5273(16)31589-3/pdf)
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