

## RESEARCH ARTICLE

# The roles of health literacy and social support in improving adherence to self-care behaviours among older adults with heart failure

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[Correction added on 7 September 2020 after first online publication: The author name 'Ahara Jo' has been corrected to 'Ahra Jo'.]

## Abstract

**Aim:** To describe the associations between health literacy, social support and self-care behaviours in older adults with heart failure.

**Design:** A cross-sectional descriptive study.

**Methods:** A total of 252 older adults were recruited from a tertiary care hospital from September 2018–February 2019. Structured questionnaires and medical record reviews were used for data collection. Two steps of hierarchical regression analysis were employed to determine the predictors of self-care behaviours.

**Results:** Health literacy ( $\beta = 0.27, p < .001$ ) and social support ( $\beta = 0.32, p < .001$ ) were significant determinants of self-care behaviours in older adults with heart failure. Together, they explained 22% of the variance in self-care behaviours.

**Conclusion:** Health literacy and perceived social support were positively associated with self-care behaviours among older heart failure patients. Our findings can help health professionals develop heart failure self-care interventions to enhance health literacy skills and social support for older adults.

## KEYWORDS

health literacy, heart failure, nursing, self-care, social support

## 1 | INTRODUCTION

Heart failure (HF) is a life-threatening condition, and its prevalence has steadily increased over the past few decades. It is expected that there will be a further rise in the prevalence of HF due to the rapid ageing worldwide (Kessing, Denollet, Widdershoven, & Kupper, 2017; Vellone et al., 2017). In Korea, the prevalence of HF is expected to increase twofold, from 1.60% in 2015 to 3.35% in 2040 (Kim et al., 2017). Despite effective medical interventions, mortality and morbidity remain high, particularly among those aged 65 years and older (Toukhsati, Jaarsma, Babu, Driscoll, & Hare, 2019). HF constitutes an enormous economic burden for healthcare systems

globally (Kessing et al., 2017; Toukhsati et al., 2019). Optimal self-care behaviours are vital to reduce adverse health outcomes among older patients with HF (Herber, Atkn, Stork, & Wilm, 2018). However, adherence to self-care behaviours is reported to be poor in older people with HF (Jankowska-Polanska et al., 2020); for that reason, underlying predictors need to be identified.

## 2 | BACKGROUND

Effective self-care, including symptom monitoring, regular exercise, sodium restriction and weight control, is a key component of HF

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management to improve the patient's prognosis (Herber et al., 2018; Jankowska-Polanska et al., 2020). Recent studies have reported that self-care behaviours can improve the health status and quality of life of patients with HF and reduce readmission and mortality rates (Beckie, Campbell, Schneider, & Macario, 2017; Lei & Cai, 2018; Toukhsati et al., 2019). Unfortunately, patients with HF feel that self-care is difficult because of the multiple requirements of treatment regimens, such as polypharmacy and lifestyle adjustments for multimorbid conditions (Jankowska-Polanska et al., 2020; Uchmanowicz, Jankowska-Polańska, Mazur, & Froelicher, 2017). Older adults with HF are less likely to adhere to self-care behaviours than younger patients are (Cocchieri et al., 2015). Hence, studies to discover meaningful factors influencing self-care in patients with HF have continued and in recent years, significant factors have been reported, including age, education, New York Heart Association (NYHA) functional class, comorbidity, disease knowledge, health literacy and social support (Beckie et al., 2017; Prochota, Szwamel, & Uchmanowicz, 2019; Seid, Abdela, & Zeleke, 2019; Uchmanowicz et al., 2017). However, the implementation of self-care for older patients with HF, in particular, is still an issue that needs attention (Prochota et al., 2019; Uchmanowicz et al., 2017).

Health literacy and social support have been emphasized in previous studies that focused on individual and environmental factors for effective HF self-management (Beckie et al., 2017; Seid et al., 2019). Health literacy is the capability to understand and use health information and the services required to make appropriate decisions for health and to apply such knowledge in daily life (Liu et al., 2019). Compared with patients with poor health literacy, HF patients with adequate health literacy can benefit from a better quality of life and clinical outcomes through improving self-care behaviours (Cajita, Cajita, & Han, 2016; Son, Shim, Seo, & Seo, 2018). A recent systematic review demonstrated that patients' health literacy level should be first assessed and considered in applying HF self-care strategies for older adults (Chesser, Wodds, Smothers, & Rogers, 2016). Another study emphasized that older patients with HF can have low health literacy through declines in cognitive function from diseases as well as from normal ageing (Son et al., 2018). Therefore, it is necessary to consider the link between health literacy and self-care behaviours carefully to improve self-care in older patients with HF.

Social support also has a positive impact on self-care behaviours, contributing to treatment adherence and healthy lifestyles, lower mortality rate and improved quality of life in patients with HF (Graven & Grant, 2014). Previous studies showed that social support such as expanding community resources for older patients with HF can promote self-care behaviours (Hammash et al., 2017; Wu et al., 2017). Social support from family and friends can be a facilitating factor in self-care confidence and self-care behaviours (Beckie et al., 2017; Chamberlain, 2017). Most older people with HF are likely to live alone, and their living arrangements are indirectly associated with HF self-care behaviours through social support (Irani et al., 2019; Weissman & Russell, 2018). Likewise,

as Korean society has aged, the traditional extended family structure has changed to a nuclear family structure. The proportion of Koreans aged 65 years or older in single-person households was 6.4% in 2015, and this percentage is expected to reach 11.8% in 2030 if the current trend persists (Korea Institute for Health & Social Affairs, 2016). One Korean study revealed that older people who led a solitary life were in a state of social isolation and faced a greater risk of lower quality of life and poor health status (Joo et al., 2019). Meanwhile, some studies have reported that the presence of social support resources alone was not linked to positive self-care behaviours (Chuang, Kao, Lin, & Chang, 2019; Strachan, Currie, Harkness, Spaling, & Clark, 2014).

A recent review also demonstrated that the major concerns of older people with chronic diseases are lack of coordination and access to information because of low health literacy and socioeconomic status (McGilton et al., 2018). In this context, health literacy is important because it provides the ability to judge whether social support resources are helpful for self-care. Accordingly, it is necessary to explore the link between health literacy, social support and self-care behaviours in older adults with HF.

### 3 | THE STUDY

#### 3.1 | Aim

We aimed to identify the impact of health literacy and social support on adherence to self-care behaviours in older adults with HF after accounting for confounding factors. Thus, we hypothesized that people with higher health literacy or higher perceived social support would report that they were more likely to adhere to self-care behaviours.

#### 3.2 | Design

This study used a cross-sectional descriptive research design.

#### 3.3 | Participants

The participants were recruited from a cardiac outpatient clinic of a tertiary care hospital with 400 beds at Pyeongtaek, Gyeonggi Province, South Korea. The criteria for inclusion were being older than 65, being diagnosed with HF and belonging to NYHA functional classes I–IV (Yancy et al., 2013). This study excluded patients who planned to receive coronary artery bypass grafting and heart transplantation; patients who had chronic kidney disease requiring haemodialysis, terminal cancer, or psychiatric diseases including depression, and patients who were unable to communicate clearly due to cognitive impairment and residing in long-term care facilities.

The sample size was 213 when calculated using the following criteria: a moderate effect size of 0.15,  $\alpha$  of 0.05, power of 0.95 and 18 independent variables for multiple regression using the G\*Power 3.1 Program. We assumed a drop-out rate of 20% and therefore distributed the questionnaire to a total of 256 individuals. Excluding four questionnaires for incompleteness or insincere responses, we analysed a total of 252 questionnaires.

### 3.4 | Data collection

This study was conducted after receiving the approval of the Institutional Review Board's primary investigator. The data were collected from September 2018–February 2019. To collect data, with cooperation from the hospital and the relevant department, a participant recruitment notice was posted in the cardiac outpatient clinic. The participants were informed that they could resign from participation at any time during the study with no penalty, and they were given questionnaires after they provided written consent to participate.

They were also informed that the data collected in the research process would be kept confidential. Given the age of the participants, the researcher read the questions aloud for each participant to complete. The questionnaire was completed through face-to-face interviews in an interview room using a structured questionnaire and each interview averaged 20 min.

### 3.5 | Ethics

This study was conducted after receiving the approval of the Institutional Review Board's primary investigator (1041078-201806-HR-124-01). Informed consent from patients participating in the study was obtained. All the data collected were used only for statistical analysis in this study.

### 3.6 | Data analysis

The collected data were analysed using IBM SPSS Statistics version 23 (SPSS Inc.). Patients' characteristics were analysed with descriptive statistics. The difference in self-care behaviours according to characteristics was analysed with an independent *t* test and one-way analysis of variance with the Scheffe's test. Pearson's correlation coefficients were used to analyse the correlation among health literacy, social support and self-care behaviours. Hierarchical regression analysis was used to identify the impact of health literacy and social support on self-care behaviours after excluding the confounding factors, which were significant in univariate analysis. All analyses were two-tailed and the significance level was set at 0.05.

## 3.7 | Validity, reliability and rigour

### 3.7.1 | Patients' characteristics

Sociodemographic characteristics, including age, gender, educational level, living arrangement, occupation, monthly income and body mass index (BMI), were documented. Two trained research assistants collected clinical information such as NYHA functional class, time since diagnosis of HF, left ventricular ejection fraction (LVEF), doctor-diagnosed comorbidities (hypertension, diabetes, coronary artery disease and stroke) and prescribed medication from medical records.

### 3.7.2 | Health literacy

Health literacy was measured using the Brief Health Literacy Screeners (BHLS), a regular health literacy measurement scale developed by Chew et al. (2008), translated and back-translated into Korean by Son and Song (2012), with confirmed reliability and validity. The instrument comprises three questions. Each question is measured on a five-point Likert scale (0–4 points), with a score ranging from 0–12. Higher scores indicate better ability in reading and understanding health information; six points or below represents poor understanding, 7–10 points represent a marginal level of understanding and 11–12 points represent an appropriate level of understanding (Son & Song, 2012). The reliability for the Korean version was a Cronbach alpha of 0.90 (Son & Song, 2012); in this study, Cronbach's alpha was 0.92.

### 3.7.3 | Social support

Social support was measured using the ENRICH Social Support Instrument (ESSI) developed by Mitchell et al. (2003), translated and back-translated into Korean and verified for reliability and content validity by the authors. The ESSI is a short, self-administered instrument that presents a single score of social support covering different types of support such as emotional, instrumental and structural. The instrument is composed of seven questions. Questions 1–6 are measured on a five-point Likert scale ranging from "Not at all (1 point)" to "Always (5 points)." Question 7 is yes/no, with "yes" worth four points and "no" worth two points. High scores indicate greater perceived social support. The Cronbach alpha of all seven questions in the instrument was 0.86 (Mitchell et al., 2003) at the time of development; in this study, Cronbach's alpha was 0.96.

### 3.7.4 | Self-care behaviours

The European Heart Failure Self-care Behaviours Scale (EHFScBS-9) was developed to measure HF patients' self-care behaviours

**TABLE 1** Patients' characteristics and differences in self-care behaviours (N = 252)

Characteristics	Category	n (%)	Self-care behaviours						
			Mean ± SD	t or F	p				
Age (years)	65–70 <sup>a</sup>	109 (43.3)	28.70 ± 7.85	3.50	.032 (c > a,b)				
	71–80 <sup>b</sup>	90 (35.7)	29.93 ± 6.65						
	≥81 <sup>c</sup>	53 (21.0)	31.81 ± 5.91						
Gender	Men	127 (50.4)	29.17 ± 7.43	-1.40	.164				
	Women	125 (49.6)	29.52 ± 7.18						
Educational level	≤Elementary school	78 (31.0)	30.97 ± 6.44	1.83	.163				
	Middle school	57 (22.6)	28.70 ± 7.38						
	≥High school	117 (46.4)	29.54 ± 7.38						
Living with	Alone <sup>a</sup>	62 (24.6)	27.56 ± 7.25	4.62	.011 (b,c > a)				
	Spouse <sup>b</sup>	68 (27.0)	31.19 ± 6.67						
	Family members <sup>c</sup>	122 (48.4)	30.15 ± 7.10						
Occupation	Employed	59 (23.4)	28.59 ± 8.20	-1.34	.185				
	Unemployed	193 (76.6)	30.16 ± 6.75						
Monthly income (KRW)	≤100	184 (73.0)	30.07 ± 6.83	0.51	.599				
	100–200	30 (11.9)	29.07 ± 8.80						
	≥200	38 (15.1)	29.03 ± 7.19						
Body mass index	Normal	97 (38.5)	29.82 ± 6.86	1.92	.149				
	Overweight	53 (21.0)	28.23 ± 7.84						
	Obesity	102 (40.5)	30.58 ± 6.92						
NYHA classification	I	127 (50.4)	29.31 ± 7.06	2.53	.082				
	II	93 (36.9)	29.56 ± 7.33						
	III–IV	32 (12.7)	32.41 ± 6.36						
LVEF (%)	<40	15 (6.0)	29.27 ± 8.11	0.04	.957				
	40–49	22 (8.7)	29.77 ± 6.80						
	≥50	215 (85.3)	29.83 ± 7.12						
Time since diagnosis of heart failure (years)	≤5	98 (38.9)	29.00 ± 7.38	2.58	.078				
	6–10	80 (31.7)	29.33 ± 7.17						
	≥11	74 (29.4)	31.35 ± 6.57						
Comorbidity	HTN, yes	121 (48.0)	30.03 ± 7.06	0.51	.609				
	DM, yes	69 (27.4)	30.33 ± 7.31			0.74	.461		
	CAD, yes	47 (18.7)	29.89 ± 7.49					0.11	.915
	Stroke, yes	14 (5.6)	33.79 ± 4.12						
Medication	ACEI, yes	65 (25.8)	29.48 ± 7.55	-0.42	.678				
	ARB, yes	55 (21.8)	29.71 ± 7.18			-0.10	.921		
	Lasix, yes	91 (36.1)	30.34 ± 6.99					0.92	.361
	Digoxin, yes	56 (22.2)	29.75 ± 6.81						

Abbreviations: ACEI, Angiotensin-converting enzyme inhibitor; ARB, Angiotensin II receptor blocker; BB, Beta-blocker; CAD, Coronary artery disease; CCB, Calcium channel blocker; CMP, Cardiomyopathy; DM, Diabetes mellitus; HTN, Hypertension; KRW, Korean Won; LVEF, Left ventricular ejection fraction; NYHA Class, New York Heart Association classification.

(Jaarsma, Arestedt, Martensson, Dracup, & Stromberg, 2009). This study used the Korean version, translated into Korean and verified for validity and reliability (Son & Won, 2020). This scale has nine questions rated on a five-point Likert scale, ranging from 1 (*I do not*

*agree at all*) to 5 (*I completely agree*). The total score ranges from 9–45, with higher scores indicating better self-care behaviours. Reliability of the Korean scale was a Cronbach's  $\alpha$  of 0.84 (Son & Won, 2020). Cronbach's  $\alpha$  for the present study was 0.81.

## 4 | RESULTS

### 4.1 | Patient characteristics and difference in self-care behaviours

The mean age of the participants was 73.65(*SD* 8.08) years, and 50.4% (127) were men. Approximately 76% (193) did not have jobs and 73% (184) earned a monthly income of less than about \$1,000 USD. A total of 48.4% (122) resided with their family. Furthermore, 87.3% (220) were NYHA class I-II and 85.3% (215) had an LVEF greater than 50%. The period since HF diagnosis averaged 8.80(*SD* 6.51) years (Table 1). Self-care behaviours differed according to the sociodemographic and clinical characteristics of age ( $t = 3.50$ ,  $p = .032$ ), living with family ( $F = 4.62$ ,  $p = .011$ ) and stroke as a comorbidity ( $t = 3.53$ ,  $p = .002$ ) (Table 1). The level of self-care behaviours was significantly higher for participants older than 81 years, compared with participants under 80 years old and for participants living with family members compared with participants living alone. Self-care was higher for older patients with HF who had stroke as a comorbidity compared with those who did not (Table 1).

### 4.2 | Mean scores and correlation of health literacy, social support and self-care behaviours

As shown in Table 2, the mean scores of health literacy, social support and self-care behaviours were 7.50 (*SD* 3.33), 26.08 (*SD* 7.28) and 29.79 (*SD* 7.12), respectively.

Health literacy ( $r = .45$ ,  $p < .001$ ) and social support ( $r = .44$ ,  $p < .001$ ) were significantly associated with self-care behaviours. Additionally, health literacy and social support had a significant positive correlation ( $r = .52$ ,  $p < .001$ ).

### 4.3 | Predictors of self-care behaviours

As shown in Table 3, hierarchical regression analysis revealed that health literacy ( $\beta = 0.27$ ,  $t = 3.85$ ,  $p < .001$ ) and social support ( $\beta = 0.32$ ,  $t = 4.61$ ,  $p < .001$ ) were both significant predictors of self-care behaviours after confounding factors such as age, living with spouse and stroke were excluded. Social support was the strongest predictor of self-care behaviours in older patients with HF. The two variables explained about 22% of the total variance in self-care behaviours.

**TABLE 2** Correlation of health literacy; social support, and self-care behaviours ( $N = 252$ )

Variables	Mean $\pm$ <i>SD</i>	Health literacy	Social support
		<i>r</i> ( <i>p</i> )	<i>r</i> ( <i>p</i> )
Health literacy	7.50 $\pm$ 3.34	1	
Social support	26.08 $\pm$ 7.28	0.52 (<0.001)	1
Self-care behaviours	29.79 $\pm$ 7.13	0.46 (<0.001)	0.47 (<0.001)

## 5 | DISCUSSION

Our main finding showed that health literacy and social support had a significant impact on self-care behaviours after adjusting for patients' characteristics. This was in line with existing studies that report that health literacy and social support were associated with self-care behaviours in patients with HF (Graven et al., 2015; Son et al., 2018; Tavakoly Sany, Peyman, Zadehahmad, Ferns, & Doosti, 2019). In this study, social support was the strongest predictor of self-care behaviours after confounding factors were excluded. For instance, dyspnoea in HF is a quintessential symptom that can lead to higher anxiety and mandates help from other people (Yancy et al., 2013). Thus, older patients with HF need a support system that can suggest strategies for implementing self-care behaviours to suit them and address multiple comorbidities (Fry et al., 2016). The support system may be their family, highly accessible local hospitals or visiting nurses (Rowlands, Shaw, Jaswal, Smith, & Harpham, 2017). Family support is vital for older patients with HF, and health-care professionals should continue to communicate with patients, establishing and encouraging self-care strategies (Bhatnagar, 2017). Therefore, healthcare professionals should be aware that a supportive family and social environment is essential for older patients to perform self-care behaviours continuously.

Health literacy was also a significant predictor of self-care behaviours in older patients with HF in the present study. Adequate health literacy can allow individuals to determine what information is needed and how to use it (Como, 2018; Fabbri et al., 2018), which leads to applying self-care behaviours for HF management in daily life (Son et al., 2018; Wu et al., 2017). However, the average score of health literacy in the present study was around 7.50, which is marginal (Chew et al., 2008; Son et al., 2018). Several researchers have also shown a high prevalence of inadequate health literacy in older patients with HF in the United States and Korea (Cajita et al., 2016; Lee & Park, 2018). Therefore, our finding indicates that tailored intervention programmes, not just educational intervention, for enhancing effective self-care behaviours should be considered to raise the level of health literacy of older people with HF.

The level of self-care behaviour in this study was 29.79. This score was higher than that of American patients over 55 aged with HF and Swedish adult patients with HF (Graven et al., 2015; Ingadottir, Ingela Thylén, & Jaarsma, 2015). Our result may be based on the condition of the patients in this study; most older patients with HF were classified as NYHA class I-II and 50% or more EF, indicating a good functional status and minimal symptoms.

**TABLE 3** Hierarchical regression analysis (N = 252)

Step	Variables	Unstandardized		Standardized $\beta$	t (p)	95% CI	R <sup>2</sup>	Adjusted R <sup>2</sup>	F (p)
		B	SE						
1	Age (yr)	0.12	0.06	0.13	2.10 (.036)	0.01–0.22	0.07	0.06	6.26 (<.001)
	Living with spouse	3.07	1.01	0.19	3.03 (.003)	1.08–5.07			
	Stroke, yes	-3.94	1.93	-0.13	-2.04 (.042)	-7.74 to -0.14			
2 <sup>a</sup>	Age (year)	0.02	0.05	0.02	0.38 (.703)	-0.08 to 0.12	0.29	0.28	20.20 (<.001)
	Living with spouse	0.16	0.98	0.01	0.16 (.872)	-1.77 to 2.09			
	Stroke, yes	-2.07	1.71	-0.07	-1.21 (.226)	-5.43 to 1.29			
	Health literacy	0.58	0.15	0.27	3.85 (<.001)	0.28–0.87			
	Social support	0.32	0.07	0.32	4.61 (<.001)	0.18–0.45			

Abbreviations: CI, confidence interval; SE, standard error.

<sup>a</sup>R<sup>2</sup> Change = 0.22.

However, the level of self-care behaviours was also in the lower range (18–34 points) presented in a review (Sedlar et al., 2017). It was again confirmed that the level of self-care behaviour in patients with HF is low. This also indicates that the highest-priority intervention is helping patients with HF to engage in proper self-care.

Health literacy was related to social support in this study. Until now, health literacy as a personal factor focused on relationships with demographic factors or individual cognitive function (Geboers, Reijneveid, Koot, & De Winter, 2018; Rowlands et al., 2017). However, the level of health literacy should be considered in an individual's social context, including living arrangements, accessible healthcare facilities and interactive communication with healthcare providers (Riegel et al., 2017). In addition, the influence of health literacy on the effect of social support should also be considered. For example, although caregivers are motivated and involved in daily support in the home, a caregiver's lack of HF knowledge could also limit the extent to which they can provide clinically effective care (Strachan et al., 2014). In this context, further studies are needed to identify the role of social support as a mediator between health literacy and self-care behaviours among the older HF population. Health professionals should recognize that early assessment of health literacy and social support for older patients with HF is critical to providing patient-focused intervention.

## 5.1 | Limitations

This study was cross-sectional, which can lead to limitations in explaining causal effects. We collected data from older patients with HF receiving outpatient treatment in a single centre; as such, caution is advised when generalizing the results of this study. We used only the independent variables of health literacy and social support

without considering other patient-specific factors such as cognitive function, depression or anxiety, commonly known through existing studies to be associated with patients with HF. Therefore, more research is needed to explore other influencing factors in a variety of ways and with participants from different cultural backgrounds. Finally, this study did not evaluate the individual components of social support, such as emotional, instrumental or informational support. Thus, we were unable to describe how self-care behaviours varied by type of social support.

## 6 | CONCLUSIONS

Understanding what HF patients need to know and from whom they receive information during the transition between hospital and home is vital to ensuring quality care. Our study emphasizes that tailored educational strategies based on patients' health literacy levels are needed to help older adults improve their self-care behaviours. Additionally, assessing and identifying patients' perceived social support, including instrumental or emotional support networks, will play an important role in enhancing older adults' self-care behaviours.

Future studies are needed to examine whether social support interacts with health literacy in affecting the health outcomes of older adults with HF. Additionally, more research is needed in this area using prospective cohort designs to determine the impact of health literacy and social support on self-care behaviours in this population.

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## CONFLICT OF INTEREST

The authors have no conflict of interest to report.

## AUTHOR CONTRIBUTIONS

All authors gave substantial contribution to and agreement on the final version of the manuscript. AJ and YJS: Conceptualization. AJ and YJS: Data curation. YJS: Formal analysis. YJS: Funding acquisition. AJ, YJS and EJS: Writing—original draft. YJS and EJS: Writing—review and editing.

## DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy and ethical restrictions.

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